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ABSTRACT

This module is the second section of a four-part how-to manual for integrating curriculum in grades K-12, especially in Missouri. The module focuses on how integration can occur, with topics ranging from communication to scheduling to various models, career paths, and thematic units. A case study and comments from teachers, students, and administrators who are actively involved in integration in Columbia Public Schools are interspersed throughout the module. The schools portrayed in the case studies were selected to represent a broad spectrum of learning environments, from urban to rural, from magnet school to comprehensive K-12. The module is organized in two sections that explain how to integrate. The first section focuses on the essential elements of communicating, scheduling, time, teaming, and administrative support. The second section examines National Center for Research in Vocational Education models, applied academics, career paths, thematic units, mental processes, and curriculum blocks. The module also includes descriptions of 10 school reform measures, a glossary defining 19 terms, and interspersed lists containing 24 references. (KC)

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A PRACTITIONER'S GUIDE TO INTEGRATION

MODULE 2

Planning Guide

CE075430

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Instructional Materials Laboratory
University of Missouri-Columbia
2316 Industrial Drive
Columbia, MO 65202

1-800-669-2465
Fax 573-882-1992

A PRACTITIONER'S GUIDE TO INTEGRATION

Planning Guide

MODULE 2

INTEGRATION WRITING TEAM

A Practioner's Guide to Integration represents a collaborative thinking, writing, and research effort of the integration writing team.

Rodney L. Custer and Michael L. Walker, Project Co-Advisors

Gregory W. Thompson, Project Manager

Patrick N. Foster, Graduate Research Assistant

Randall T. MacPherson, Graduate Research Assistant

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MODULE 2: PREFACE

"A Practitioner's Guide To Integration" is designed to serve as how-to manual for anyone, grades kindergarten through twelfth, who is interested in integrating curriculum. The manual is divided into four separate modules, each of which discusses a common question related to integration. These modules are: Module 1: What is Integration? and Why Integrate? Module 2: Why Integrate? Module 3: How to Integrate - Step-by-Step, and Module 4: How Do We Assess Integration Throughout the District?

Module 1, provides a definition for integrated learning and suggests ways to categorize types of integration. It also examines the benefits of integration for everyone involved and dispels many of the common myths about integration. This module, Module 2, focuses on how integration can occur, with topics ranging from communication to scheduling to various models, career paths and thematic units. Module 3 outlines step-by-step procedures for integrated units, integrated years, and integrated schools. Module 4 discusses the topic of assessment and provides suggestions for assessing students, integrated teaching, and integrated programs.

Each module is intended to stand on its own. Readers should feel free to select one or more of the modules that are particularly pertinent to them. In keeping with the independent nature of the modules, each module concludes with its own resource list of pertinent materials to refer to for additional information.

Case studies and comments from those who are actively involved in integration can be found throughout the modules. They can serve as a rich source of ideas and inspiration and can help readers learn from the experiences of others. Although each case study is located in one of the four modules, each study has much to say about many different topics, not just the topic addressed in that particular module. The schools portrayed in the case studies were selected to represent a broad spectrum of learning environments, from urban to rural, from magnet school to comprehensive kindergarten through twelfth grade.

To understand integration in an actual school setting, we chose a case-study design. Our review of literature told us that integration was an evolving practice with different schools taking different approaches. We selected our sample from schools that educators identified as attempting integration in various degrees. We also used schools that represented different segments of the educational system in Missouri, such as small

schools, intercity schools and schools that are integrating through different grade levels. Throughout this document you will visit four case studies that outline various methods of providing integrated learning. We found these schools to vary in different degrees and also found some common threads throughout all of the schools.

We found in most cases, changes in pedagogy and curriculum were not the results of mandates, but rather a bottom-up, grass-roots effort by teachers to improve their own classes. Integrated academics were initiated by teachers or administrators who felt frustrated that their students were unprepared for the workplace and unable to make connections between subject matters.

The desire for the teacher to transmit knowledge is deeply rooted. A teacher's collegiate experience is usually dominated with instructional format that emphasizes transmission of knowledge through lecture. Modeling from generation to generation has been the practice in many classrooms.

It's not that educators have been doing a poor job of educating all along. But, our current educational system, which was developed in the early 1900s in response to the industrial revolution and patterned after the assembly line, no longer meets the needs of a technological/ information society competing in a global marketplace. The education system of the 21st century should parallel the "real world" and should implement site-based decision-making, strategy planning and total quality management processes used in industry.

Have previous educational reform methods provided a bandage or the cure to our educational system? Most educators will answer "a bandage." Integrating academics will be successful because it attempts to RESTRUCTURE the delivery of our educational system.

In restructuring, we must remember: the teachers are the foundation of every educational structure. To reinforce the foundation we must provide teachers with new methods, techniques and ideas for teaching. We must reinforce the foundation with quality materials that are useable to teachers. The teachers will polish and shine the materials and present them in a method that the students will grasp and understand.

Advisory Committee

Pam Conway
Principal
Mill Creek Elementary - Columbia

Sheila Perry
Elementary Teacher
Bloomfield Elementary - Bloomfield

Rhonda Schlesselman
Elementary Teacher
Cole Camp Elementary -Cole Camp

Marianne Fues
Elementary Media Specialist
Boone County R-IV Schools - Hallsville

Janet Love
Art Teacher
Hazelwood Junior High - Hazelwood

Doug Steinhoff
Science Teacher
Jefferson Junior High - Columbia

Gary Summers
Principal
East Bechanan Middle School

Peggy White
Language Arts Teacher
Columbia-Hickman High - Columbia

Rich Trinklein
Math Teacher
Hallsville High - Hallsville

Chrysa Niewald
Guidance Counselor
Owensville High - Owensville

Kathy Quick
Social Studies Teacher
Mexico High - Mexico

Ralph Corse
Science Specialist
Kansas City Public Schools

Art Daniels
Science Teacher
Farmington Senior High - Farmington

Marge Lechner
Language Arts Teacher
Melville Senior High - St. Louis

Jim King
Principal
Rockbridge High - Columbia

Wayne Mosher
Principal
Emil E. Holt Senior High - Wentzville

Jim Kyd
Technology Teacher
Columbia-Hickman High - Columbia

Craig Adams
Technology Education Teacher
Jefferson Junior High - Columbia

Carl Locke
Electrical Trades Instructor
Graff Career Center - Springfield

Arlene Broeker
Business Technology Instructor
Nichols Career Center - Jefferson City

David Twente
Vocational Agriculture Instructor
Wellington-Napoleon High - Wellington

Bessie Hampton
Coordinator, Family and Consumer Sciences
Kansas City Public Schools

Ron Jones
Director, COE and A+
Mehlville Senior High - St. Louis

Harold Ward
Director
Hannibal Area Vocational School - Hannibal

Paul Coffman
Director
Northwest Technical School - Maryville

Jim Everett
Manager, Technical Preparation Consortium
Metro Community College - Kansas City

Beth Allen
Assistant Principal/A+ Schools Coordinator
Wentzville Public Schools - Wentzville

David May
A+ Schools Coordinator
Chillicothe R-II School - Chillicothe; Brookfield R-III Schools - Brookfield

Kim Graves
A+ Schools Coordinator
Smith Cotton High - Sedalia

Peggy Jacoby
A+ Schools Coordinator
Fulton Senior High - Fulton

Ralph Powell
Superintendent
Boone County R-IV Schools - Hallsville

Steve Coffman
Assistant Director, Goals 2000
Department of Elementary and Secondary Education - Jefferson City

Susie Cox
School-to-Work Coordinator
Columbia Career Center - Columbia

Mike Willard
Curriculum Director
Troy R-III

Carlos Miranda
Curriculum Supervisor, P.E./Dance
St. Louis School District - St. Louis

Joe Panhorst
Assistant Principal
Gateway Middle School - St. Louis

Paul Pitchford
Senior Research Analysist, Dean of Education
University of Missouri-Columbia

Gary Smith
Director, Admissions
University of Missouri-Columbia

Al Babich
Vocational Resource Educator
Northland Career Center - Platte City

Department of Elementary and Secondary Education

Robert Bell
Director, Professional Development - Division of Urban and Teacher Education

Earl Finley
Assistant Commissioner, Division of Instruction

Russel McCampbell
Assistant Commissioner, Division of Vocational and Adult Education

Grace McReynolds/Charlotte O'Brien
Coordinators, Curriculum Services - Division of Instruction

Fred Linhardt
Director, Vocational Planning and Evaluation

Delbert Lund
Supervisor, Vocational Planning and Evaluation

University of Missouri-Columbia

Rodney L. Custer
Project Advisor

Michael L. Walker
Project Advisor

Gregory W. Thompson
Project Manger

Patrick N. Foster
Graduate Research Assistant

Randall T. MacPherson
Graduate Research Assistant

Instructional Materials Laboratory

Harley Schlichting, Director
Phyllis Miller, Associate Director-Development
Dan Stapleton, Assistant Director-Production
Kristin Desborough, Editor
Lorraine Hilgedick, Assistant Editor
Jan Trimble, Word Processor
Leslie Forbes, Graphic Artist
Kristen Jackson, Graphic Artist

Glossary of Terms

1. **Academic performance standards** - consist of selected target knowledge or behaviors which students should be expected to perform prior to successfully completing an educational program.

2. **Authentic assessment** - assessment of student performance based on "real world" experiences or standards found in or associated with the world of work.

3. **Cognitive complexity** - one of the key features of authentic assessment procedures is that they be sensitive to the cognitive complexity of students. Does the assessment procedure capture my student's ability to think or have I only focused on facts. Does the tool provide some indication of their problem-solving ability as well as the processes they use to address problems?

4. **Competency** - is a learned behavior which can be repeated to predetermined standard.

5. **Competency-based education** (CBE) - is a methodology of instruction that (a) identifies the cognitive, psychomotor, and affective skills needed to meet a specific standard; (b) informs students and teachers of the precise and detailed learning objectives required to achieve performance; (c) emphasizes performance standards in testing, course requirements, and/or graduation; and (d) facilitates learning by allowing each student to master the task through flexibility in learning time and methods.

6. **Content quality** - most academic disciplines have developed, or are in the process of developing standards. In vocational areas, there has been a long history of identifying and validating competencies for the various technical service areas. Teachers should ask "Do my assessment tools accurately connect with those standards that have been established for my teaching area?"

7. **Content standards** - spell out the subject-specific knowledge and skills that schools are expected to teach and students are expected to learn. Standards-setters have adopted the shorthand phraseology "what students should know and be able to do."

8. **Criterion-referenced evaluation** - is a procedure that measures student performance or knowledge according to the conditions and standards stated in the performance objective.

9. **Endogenous model** - is viewing education from *within the educational system.*, i.e. Curriculum divided into familiar academic disciplines (math, science, history, music, etc.); intelligence and achievement defined in terms of verbal (reading and writing) and analytical abilities.

10. **Exogenous model** - is focused on the perspective of *what is valued and needed by society*, curriculum organized around the needs of society and the development of specific competencies (integrated topics, workplace issues, societal issues, technical & social problems, etc.) ; intelligence viewed in multiple ways including problem solving, concrete and applied abilities.

11. **Integration or integrated/infused academics** - is a process of forming, blending, coordinating or weaving into a functioning or unified whole. It is the fusion of what were separate or distinct disciplines into one subject area.

12. **Interdisciplinary unit of instruction** - is materials and/or information spanning or crossing one or more disciplines necessary for instructional periods for the teaching/ learning process in order to reach the unit objective.

13. **Performance objective** - is a statement of what the student must do in observable and measurable terms.

14. **Product evaluation** - is the rating of the product of a student's performance: also a summative evaluation.

15. **Process evaluation** - is a measure of a student's ability to perform a given procedure: also a formative evaluation.

16. **Rubrics** - are scoring devices (or tools) which are designed to assist in the process of clarifying and communicating expectations. Rubrics are expectations or grading grids which contain specific information about what is expected of students for every performance standard.

17. **Task analysis** - is the identification of cognitive, psychomotor, and affective skills needed to perform a specific task.

18. **Taxonomy** - is a system of classifying objectives into types or levels. Examples: Bloom's Taxonomy, Snyder Taxonomy.

19. **Unit objective** - is a statement of the intended purpose (overall behavioral outcome) expected of each student after completion of a unit of instruction.

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School Reform Measures

1. Workforce 2000 - a study published in 1987 was the basis for President Bush's education reform in America 2000. The report recommends better skills training and improved service productivity as needed for future job expansion. The report projected a continued shift from manufacturing to service employment.

2. **A Nation At Risk** - A 1983 report by the National Commission on Excellence in Education called for major changes in public schools and criticized America's educational system for producing high school graduates with fewer academic abilities because of too many general track courses, fewer students in higher science and math, and a decreased time spent on homework. The study recommended Vocational Education should demand the same stringency.

3. **The Unfinished Agenda** - A 1984 report by the National Commission on Secondary Vocational Education promoted the integration of academic and vocational education along with emphasizing the intensity in academics for vocational students. The commission recommended bridging the gap between academic and vocational courses.

4. **SCANS** - (Secretary's Commission on Achieving Necessary Skills) Developed by the Department of Labor that concluded: that basic skill competencies "should be taught and understood in an integrated fashion that reflects the workplace contexts in which they are applied."

The commission spent two years studying what people need to know to hold productive and high-paying jobs. The Commission emphasized not a change on what is taught - only how it is taught.

5. **America 2000** - President Bush's national education goals:

   a. All children start school ready to learn
   b. A 90% high school graduation rate
   c. Competency in English, math, science, history and geography
   d. Every adult American will be literate
   e. Every school will be free of drugs and violence

6. **A Nation Prepared** - Carnegie report in 1986 asserted the need to "restructure school to provide a professional environment for teachers, freeing them to decide how best to meet state and local goals for children while holding them accountable for progress."

7. **The Outstanding Schools Act of 1993** - The Outstanding Schools Act of 1993, signed into law by Governor Mel Carnahan on May 27, 1993, after passage with bipartisan support in both houses of the Missouri legislature, dramatically improves public education throughout the state. It increases Missouri's financial investment in education by more than $360 million a year over FY 1993 funding, but more importantly, it sets into motion a series of carefully planned and thoughtfully orchestrated reforms designed to transform Missouri's school system into a model of educational excellence.

8. **Tech-Prep and the Perkins Act** - Tech-prep Education is addressed in two different segments of the Carl D. Perkins Vocational and Applied technology Act of 1990.

Title II, Basic State Grants, Section 235, Uses of Funds: The law identifies a Tech-Prep program as an allowable expenditure providing it meets three requirements:

1. The size, scope and quality to be effective
2. The integration of academic and vocational education through a coherent sequence of courses
3. Equitable participation for special populations

Title III, Special Programs, Part E: Tech-prep education receives major emphasis under Title III and the law emphasizes two purposes:

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1. "To provide planning and demonstration grants to consortium of local education agencies and post-secondary educational institution, for the development and operation of 4-year programs designed to provide a Tech-Prep program leading to a 2-year associate degree or a 2-year certificate."
2. "To provide in a systemic manner, strong, comprehensive links between secondary and postsecondary educational institutions."

9. **School-to-Work Opportunities Act** - On May 14, 1994, President Clinton signed the STW Opportunities Act into law. The purpose of the Act was to develop a nationwide school-to-work system to address the serious skills shortage in our Nation's youth entering the workforce. The end result was unprecedented cooperation between the Department of Labor and the Department of Education. The goal is to insure students have a seamless transition from secondary education into meaningful, high-quality employment and/or further education.

10. **A+ Schools Program** - A provision of S.B. 380 is the A+ Schools program. The program is designed to provide high school students in the state of Missouri with an exciting and rigorous program of academic and technical education that leads to community college or workplace skill development. The Outstanding Schools Act establishes the A+ Schools program to provide grant awards to Missouri's public secondary schools that demonstrate a commitment to insure that:

1. All students be graduated from school
2. All students complete a selection of high school studies that is challenging and for which there are identified learning expectations
3. All students proceed from high school graduation to a college or postsecondary vocational or technical school or high-wage job with work-place skills development opportunities.

Columbia Schools' Case Study

There's a minor crisis at Hickman High School.

"There's a $30 million satellite off course heading toward the students," a teacher is saying, "and they have to figure out either how to cipher the binary code to get it back on track in a certain amount of time, or blow up the satellite to keep from dying."

Okay—it's a major crisis.

"They get stressed," the teacher concludes.

It's true. The students are scurrying around, making adjustments to the 50-foot-long space station they've built in their classroom. Several of their communications nodes are down. It's nearly 10 p.m. on a school night. Could things get worse?

Well, things just did get worse. Heidi, a senior at Hickman, explains that the European Satellite Association has contacted the students. But she says they can't tell if the person speaking to them is speaking in German, French, or Spanish. "We have to group up and use our foreign language skills."

"Something like this happens every year," confides another student.

What's going on here?

"CASA," says Mike, a senior. "Columbia Aeronautic and Space Administration. A small simulation of what NASA does, where we actually build a space station. All grade levels are incorporated into a one-week mission. All the different schools perform experiments, apply what they've learned at all levels."

"We don't dilly dally around," confirms Jason, also a senior. "We get to the point. It's not like other classes."

Obviously.

"This is the bridge." Heidi is showing some visitors around the station a few weeks after the mission. "It's where all the main operations go on." She touches the switch to activate the automatic sliding door.

Nothing happens.

Maybe not all of the operations are going on here today.

"This isn't working right now because there's a limit switch out of order," announces Travis, a senior. He says this is a recent problem,

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and he's working on it because he built the door. He points to another door.

"This one works," he says, working the switch. "Open, close, emergency... In this project alone I had to read a lot," he offers. "We had to build a power supply. We had to turn 110 volts AC into 18 volts DC—how do we do that? I had to go through each step: build it, test it, get it to work—never mind building and framing the door."

Of the class, he says, "It's very individualized."

"One of the most unique aspects," Jessica, a junior, says, "was that it included people of all ages and backgrounds working toward a common goal." "You can see how you'd use these experiences in life," she concludes.

Mike agrees. "You synthesize what you've done in other classes," he begins. All of a sudden the bell rings. Time for the next period. "We've probably learned the same amount as in other classes," he continues— (Mike ignores the bell. Students can continue to stay through lunch hours, study hall periods and after school.) "It's not how much you've learned, but how you learned."

• • • •

Mike's philosophy isn't very different from that of Sylvia McGill. "With integration," she says, students are given "one package that fits and makes sense," rather than "separate subjects."

Sylvia McGill is a **multimedia specialist** at Mill Creek Elementary school in Columbia. "Kids get much more positive, much more enthusiastic," she says. "They don't even realize they're learning."

She cites a recent project in which third-graders learned about US presidents.

"Third-graders used to get an isolated library experience," she says, "but this year we wanted to pull it all together." The topics in the third grade included government, and Washington DC, as well as portraiture in art class. So the teachers "developed a very integrated unit. The students took their library research back to the classroom and wrote reports," McGill says.

Sally Froese, Mill Creek's art specialist, was already planning to teach portraiture to the third graders. She found that since the students already knew a lot about the personality of the presidents they were studying, she could focus more on the importance of capturing the essence of the person being drawn and less on having them research that person.

"It sounded at first like we were being asked to do a lot of extra work," Froese admits. "But I found that it was much to my advantage.

... The classroom teacher was helping me teach the more verbal information. The children were much more interested and produced art way above typical third-grade portraits."

"I felt good about it because the research (the third graders did) was actually utilized for something," McGill says, "so they could see it was authentic." McGill wasn't the only one who felt good about it. She says parents invited to an open-house parent fair at the school were "really, really enthusiastic" about the project and others like it.

Mill Creek principal, Pam Conway, states the obvious. "Integration," she says, "has been identified by teachers as a school goal." Of her teachers, she says, "they're teaching children instead of curriculum." After teachers really start differentiating instruction, "integration is a natural."

But if integration is natural, it certainly isn't predictable. The serendipitous beginnings of the integrated unit on the presidents is a good example of the type of integration Conway encourages at the school.

"We don't buy anything wholesale here," she says. "We're looking for pieces of things that will fit and will work for our children. We have to explore all the options that are out there."

"At Mill Creek there is a professional atmosphere" which encourages integration, says **fourth-grade teacher Sally Lyon**. Lyon agrees with Conway that integration is a natural way of organizing the school day. "It just makes more sense," she says.

Even before they're school-aged, Lyon notes, "children don't say 'I need to learn how to add.' They say, 'how many are there?' They don't say 'I'd like to learn social studies;' they say 'what's it like where grandma lives?' They only think in terms of disciplines when they get to school."

The result, Lyon says, is that "children attend better, children respond better, children are more interested."

Apparently interest and enthusiasm are contagious at Mill Creek. "It's so fun to see this kind of enthusiasm," says McGill.

Pam Conway likes to tell the story of how enthusiasm itself once furthered the cause of integration at her school. A teacher had agreed to try an integrated unit in her classroom. It being the first time the teacher had tried this, it was a lot of work. But it was also very successful. Conway was delighted, and didn't want to push the teacher to do more until she was ready.

Right after the unit was over, the teacher met Conway in her office.

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"She said, 'I have to do this all year,'" remembers Conway. "I said, 'no you don't.' But she said, 'Yes, I do.'" "I can't take kids that excited back to a textbook."

• • • •

Across town at Jefferson Junior High School, a completely different type of integration has been operating successfully for two years. During a free period, **Craig Adams, a technology teacher**, and **Doug Steinhoff, a science teacher**, discuss their unique program.

Craig Adams: "We have a science and technology course with 20 to 25 kids in each of four sections. Each class meets for a two-hour period. What we've done this year is take science concepts—Doug's objectives—and back them up with technology principles. We did a rearrangement of both of our curriculums. For example, in his class they learned Archimedes' principle; in my class they built submarines."

Doug Steinhoff: "The whole program came about three years ago. One of the things I was teaching was physics—simple machines and how they work. At the same time, Craig was teaching and building robots. His kids understood how you can lift a heavy object or work faster, while my kids were learning the same thing. But the hands-on [aspect of science class] wasn't nearly as detailed as in robotics class. So we put the classes together."

Adams: "Our administrator gave us a shot at doing this. We tried it for a year, gave a presentation at the board office, and it went over very well. Now we're up to four sections [one hundred kids], and we'll continue [that way]. Most of the time [our classes] are separate, and some activities we do together. In the land formations unit, students can spend the two-hour project all with one teacher."

Steinhoff: "Every unit we do covers some MMAT objective. So we have to jump around a little bit. We designed the curriculum around the MMATs. Every unit has one problem that we assign. For example, 'be able to calculate density and volume;' 'be able to understand Archimedes' principle...' [We said], 'let's design a project where the kids learn these objectives by building.' Density, for example, is automatically worked into the submarine project. They can't do the project successfully without really understanding scientific principles."

Adams: "This is more of a life-skills approach to an activity. You don't do things only in an educational setting. We use information from other teachers too. The kids do a lot of writing in our courses, a lot of essays. We incorporate social studies, math and science [into the technology activities]. [As for assessment], everything is done in portfolios here. We worked extensively with the social studies coordinator. He helped devise a way to do a lot of [the portfolio work]."

"Originally, we wanted to involve a math teacher too, but getting that third component in there was really hard. There were some things that didn't work out last year, but we saw a vast improvement this year; next year will be another vast improvement."

Steinhoff: "We didn't have problems getting kids into the class; the biggest hindrance was the scheduling, I think. It can be a hassle"

Adams: "The principal had long ago bought into the idea, but NOW the time was right. We're loaded with kids next term—you don't have to sell this [—it sells itself]."

Steinhoff: "Kids are doing things here they don't normally do in school;

[our promotion] is just word of mouth."

Adams: "And we haven't had any parent problems [where parents assume the class isn't high-quality]—one dad said this was the best course his daughter ever had, and she's a straight-A student."

Steinhoff: "At first you have to get to some of that dog and pony show, where you have to convince [the students] this is going to be fun, convince them this is going to have relevance. [After the first weeks of class], I don't have to convince them any more. They're confident that this is something they're going to need to know."

"And that's it. For me, it's completely different from what I was doing before. This gives a legitimacy [to the science subject matter that it didn't used to have]. In the beginning retention wasn't there, they didn't remember things as well."

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Adams: "That was kind of interesting—like when we did the gas laws unit. [The kids] could tell you basically what the universal gas law was months after we did it in class, because we took apart the refrigerator and saw why it got cold here, warm there. They knew what all the parts were and they actually got their hands on it. In several cases, a [student would say], 'I never knew how this stuff worked; I never really cared.' So that might be a plus too—they're more interested in how things actually do function, how things operate."

Steinhoff: "Before you'd see kids come in really skeptical [about their own abilities]. But by the fourth quarter, the kids are thinking of different ways of doing things, instead of doubting [they could do them]."

Adams: "Like the submarine project—[it was the first project of the year last year]. We had one submarine, fifty copies. In the latest project, they're trying to keep them different. Now most students feel comfortable enough with their own abilities that they take their own paths."

Steinhoff: "They're trying to come up with new ways to do it. They'll be a lot more prepared to enter the workforce and start doing some of these things they learn."

Adams: "[For class projects], they choose their groups according to specializations. Before they chose their buddies, but several groups have chosen like this: 'she's really good at drawing, we want her to draw the plans, and this girl, she's good at concepts, this boy's a great writer—' they put them together— 'this girl has picked up electronics, this boy.....' They choose their groups according to specializations that they've noticed through the year and those groups are really screaming right through this project."

Steinhoff: "The main barrier is fitting the course into the specified guidelines, what we have to teach, where if we could expand we could go a lot farther. Scheduling and room assignments can be a problem."

Adams: "Yeah. He's at the top of the building, I'm at the bottom, so we're not right next door. We did all the planning on our own time, over the phone. But we knew each other even before we began teaching. We're thinking about [trying to get] a trailer for the class.

Steinhoff: "And we're trying to get parts, get machinery...[we go through this trouble] because [the course] brings a lot of insight to the students—that common question, "why do I have to learn this stuff?"

Adams: "I never heard a kid say 'why do we have to know this?' in the two years I've been teaching this class. Take the 'roverbots' unit. The students have a robot demolition derby. The competition is to see [whose robot can last the longest]. This makes my job easier in terms of getting these [science] concepts across. We used to do this activity with strictly a technology class, but [integrating] gives a legitimacy to what we're doing. It gives them a reason."

Steinhoff: "We noticed that we were teaching basically the same thing, one hands-on, one more theoretical."

Adams: "[Doug and I are] two people working toward a common goal, to get some of these concepts across to the kids. I think that's a benefit for these kids: two sources they can get information from. If they don't understand something in one of the classes, having both of us available is a plus for the kids. These are concepts I used to struggle with, like mechanical advantage. This puts two people on it."

Steinhoff: "[That's what] integrated teaching is—teaching curriculums with a broader base, in a unit, rather than distinguishing between subjects. [But] our approach to integration [is unique to our situation. For teachers thinking about integrating, I'd say,] 'check out as many integrated programs as you can. Find out what they're doing. Be open-minded, objective."

Adams: "It's fun, not the boring type of setting. It's a lot more exciting, a lot more hands-on. It incorporates a lot more—like the way education should be. But [like Doug said,] you can't get a canned integration program and make it fit any situation. We're a [special case]."

Steinhoff: "Yeah. We're [good] friends. We both have the same hobbies. We work together outside of school."

Adams: "That's a key component to [our success], the two of us [working well together]. When teachers say "[integration] is so much more work than what I was doing," I think it's because you have a possible personality conflict. [Teachers] have to be really dedicated, really focused on it."

"I think that's a key to the success of it."

• • • •

Back at Hickman High, **Peggy White, English teacher,** and **Jim Kyd, technology teacher,** finally get a chance to sit down at the end of the day.

And they cause you to wonder: if the key to the success of Doug Steinhoff and Craig Adams is their similar personalities, how can you account for the success of the teaching team of Kyd and White?

"Personality-wise, we're very different," White says.

"Yeah. There's the potential for driving each other nuts," agrees Kyd.

White and Kyd manage not only to get along, but to team teach a very successful course in aerospace technology at Hickman.

In the class—which was described earlier—students hone and use language and technology skills to solve a realistic problem which has them simulating a week-long space voyage. The integration of language arts and technology education in the course is seamless.

"We don't separate the disciplines at any time," says White. "We bring them together." "It's a natural coupling of them." This is not only made possible, but made necessary by the integrated course's goals, she says, one of which is "to emulate the ways the real world functions—to create a real-world environment."

When asked what integrated teaching is, White replies simply that it is the "merging of disciplines."

Here's where the differences between her and Kyd begin to make themselves quite clear. Kyd doesn't have a three-word definition for "integrated teaching."

"Traditional education for years has given students the wrong algorithm for success," Kyd begins when asked for the definition. "If you're standing in New York and you don't know anything about New York, you're going to have a hard time getting around. So you use an algorithm—in this case, a map—and you could probably be successful."

Kyd continues. "But what if that was a map of Detroit? That algorithm probably wouldn't ensure success. I feel like that's what we've done in traditional education...students are given a map that says 'New York—' but it's of Detroit."

To some degree, the teamwork between White and Kyd is a model for student performance in class. "Industry tells us that being a team player is important," says White. With her background in communications, she says, "I really stress working in a team."

"Companies will say, 'if you know your math and science, we will hire you,'" Kyd begins. "'But if you can't write a literate letter or you can't communicate with the public, we will never advance you vertically.' You'll never speak for the company; you will never go up in the structure," he says.

This is not the first time White has emphasized employability skills in her classes. In fact, it was her desire to improve the tech-prep curriculum in her own classes that started the whole thing.

"I felt overwhelmed with the tech-prep curriculum I was using in my English class," she recalls. She and Kyd "met in the hall one day when I was taking some students to the library and I started asking him about communication and how it was taught in a practical-arts class."

"I was tickled pink," says Kyd.

It wasn't too long before they decided to give the integrated aerospace class a try. "I wanted to learn this aspect of real-world communications," said White.

And she did learn—the hard way.

"We had a lot of rough spots the first year," White concedes. "But I couldn't have learned about aerospace curriculum had I not lived through the class." She spent a lot of time studying instructional materials in aerospace technology, but in retrospect, she says, "They didn't prepare me... Until I actually spent a year in this curriculum, I would not have understood what I was getting into."

What if she could do it all over? "I wouldn't do anything different," she says.

Kyd acknowledges the dissimilarities between White and himself, but insists that what really makes them work as a team is their strongest similarity. "The bottom line is: the real bedrock you have to stand on as a team teacher is that you have true belief in the philosophy of empowering students. If you have really dissonant viewpoints" about that, he says, "I don't think the team's going to stay together."

"I'm a broad-brushstroke, foam-at-the-mouth person; Peggy makes sure everyone's accountable. But we both are after trying to empower the students."

"Our teaching philosophies are quite compatible," White says. "That's crucial."

Well, at least they agree on something.

Essential Elements of Integration

While each school's needs with regard to integration will vary, there are several essential elements that all schools would do well to keep in mind as they begin the process of integration. These elements are detailed in the following section and include:

Communication, both internally with teachers, administrators, school board members, staff, and students and externally with parents, community members, and business and industry;

Scheduling, which must many times be modified from the traditional schedule to accommodate the need for such things as longer class periods and joint-planning periods for teachers;

Time, as integrated learning tends to take more time for planning and implementation than more traditional instructional formats;

Team building, which many of those involved in integration see as an important key to the success of integrated learning; and

Administrative support, as the administration must articulate and defend the school's vision and goals and will, ideally, support in a variety of ways teachers' efforts to integrate.

Communicating

"If integrated academics is as good as you say, then it will sell itself and we won't need a marketing plan." This type of comment is heard by some people as they attack yet another educational reform measure. Good programs do sell themselves, however, a marketing plan is still necessary. Any time you introduce something new to the public, you must sell that idea to get their "buy in." Your school district patrons want to know what is going on in the district. Community members get very disturbed when something "new" is going on in the schools that leaves them uninformed. Marketing the integrated teaching concept is no more than simply informing the public and educating them as to what integrated teaching is all about. Integrated teaching will "sell itself," but until the community actually sees results, you must sell the idea to them.

Marketing is more than advertising and selling. It is the process designed to effect the transfer of the product (integrated teaching) for the "producer" (your school) to the "consumer" (the student).

"... for nothing - absolutely nothing - happened in education until it happens to a student."

-J. Carroll

A comprehensive marketing plan must present:

- THE RIGHT MESSAGE
- TO THE RIGHT PEOPLE
- AT THE RIGHT TIME

Generally, you get people's attention for the first time once, and you must make sure you create the best first impression possible. To accomplish this, you must coordinate materials, take advantage of optimum timing and deliver a powerful persuasive message.

Internal Publics

The most important group of people to sell first, are the people within - teachers, administrators, school board, staff, and students. Forgetting this most important group will surely defeat the purpose of marketing integrated academics to the community. Ownership of the concept and "buy in" from the school is the key to a well-developed marketing program.

Students and staff will sell the integrated concept. Business and industry term this phenomenon "word of mouth" advertising. It is the most powerful and least expensive method of marketing an idea or product. In any organization, a climate exists. Whether it is energetic and committed to success, or apathetic and committed to

just "getting by" depends on how well the school system takes charge of the climate and shapes it to its own ends.

The strength of word-of-mouth advertising depends upon internal marketing, or selling the concept to the staff. Personal experience or knowledge of the experiences of friends and relatives will outweigh messages from strangers in shaping opinions and perceptions. Every member of the school staff is important to the success of integrated teaching. You must ensure that everyone from the school board to the custodian feels included. Teachers and staff members must remember they are front-line marketers on and off the job.

According to the many resources and individuals we have visited with concerning integrated academics, the best way to sell the concept is through involvement at the "grassroots" level. Teacher involvement in the planning process is essential. Teacher resentment stems from the idea that they are excluded from the planning process and "the administration had already decided what and how they planned to integrate." Never underestimate the need to communicate with all teachers and counselors in the school. The "doors of communication" must always be open to teachers and staff.

External Publics

After establishing a clear internal image and all groups are working together, you are ready to move forward with an external communication program. Educators must continuously strive to improve communications with their external publics. Developing a good marketing program with the school's external publics is different from the procedures used for internal image building. Communicating with those outside education involves communicating better rather than just communicating more.

Parents

Parents may be the most difficult audience to sell on integrated teaching. Their goals, like ours is the best education for their child. If parents don't recognize the benefits of integrated teaching they can sabotage the entire project. Negative comments in informal settings can do tremendous damage to any reform movement in its formative stages. Some misinformed critics may go even further, mounting an organized effort to derail integrated teaching before it even gets off the ground. On the other hand, a nucleus of parents who understand the integrated concept is beneficial to their child can drive the system by spreading the word.

Parents are most often influenced by their peers (neighbors, friends, coworkers, employers, and relatives) with whom they come in contact everyday. Parents may also be influenced by teachers, administrators, and counselors. Personal experiences and contacts are important marketing components.

Audience messages

In marketing integrated academics, you always need to answer the question: "What's in it for me?" In order to meet that particular need of your audience, it is important to know who your audience will be and how you plan to approach this audience. Remember what your particular audience is interested in: "What's in it for me?" Address your audience accordingly.

The marketing message must explain the benefits of integrated teaching. They are:

1. Benefits that promote the major goal of educators: student success.
2. Benefits to fulfill the dream of parents: a bright future for their child.
3. Benefits that attract the student: an education that makes sense now.
4. Benefits that appeal directly to business and industry: profits.

Local marketing activities

1. Provide recognition and/or rewards for early supporters of the integrated concept. Teachers may be rewarded with the opportunity to attend state and national conferences and to be presenters themselves. Certificates of appreciation and news coverage for business/industry or organizations will help promote the program and develop good public relations with the community.

2. Develop and distribute materials and a series of local workshops on integrated academics to be presented to community organizations. Early buy-in individuals or groups who are excited about integrated teaching will be tremendous help in selling to their peers.

3. Prepare an information packet about integrated academics keyed to interests of business and industry - better trained workers, higher profits, etc.

4. Arrange to be on the program of every civic, service and professional organization that involves business and industry.

5. Provide short articles about integrated academics to editors of newspapers as well as professional publications.

6. Use business and industry administrators as speakers at PTA meetings and other parent gatherings.

7. Include a segment of integrated academics at back-to-school nights and other appropriate occasions.

8. Hold a special meeting to introduce integrated academics to the media. Bring in your "heavy hitters" from your advisory committee or ad hoc committee from business/industry, labor, educators, legislators, etc. Have a professional-looking media packet ready to pass out.

9. Develop an attractive brochure about integrated academics. Vary the brochure for various audiences.

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10. Feature integrated academics success stories in school newspapers and on school calendars.

11. Arrange for business and industry representatives as well as college and university representatives as guest speakers for classes, to talk about opportunities and the skills employers are looking for in their employees.

12. Create special awards for students to be presented at the annual awards assemblies.

13. Ask business/industry to sponsor a large ad or insert in the community newspaper. Stress the results and positive aspects of integrated academics.

These are only a few ideas on marketing the integrated academics concept. It is of vital importance that the public (whether we are talking internal or external) is well informed. Most reform ideas are lost not because of a poor idea, but because of a poorly informed public. You will find out how interested the community is in the school when you try a new approach to education with the community being informed or involved.

There are a number of excellent resources to help in building a public relations program.

The American Vocational Association (AVA) has developed two excellent marketing publications: Marketing Vocational Education : A Handbook for Vocational Educators Tech Prep Marketing Guide. Another helpful source is Promoting Your School by Carol Warner. These resources are available for loan from Missouri Vocational Resource Center (MVRC) - 8 London Hall, University of Missouri; Columbia, MO 65211. (1-800-392-7217) Oklahoma School-to-Work Marketing Technical Committee has developed a useful and up-to-date (1995) resource: The Career Connection Marketing Plan available through Public Information; 1500 W. Seventh Ave. Stillwater, OK 74074 (405)743-5108.

Evaluation

An essential aspect of marketing is market research. Evaluation is often the most neglected part of the marketing plan. Some feel that formal feedback is not necessary if things appear to be going well. A marketing plan is not complete without a carefully designed and implemented evaluation component. Whether you utilize formal research methodology or informal methods, an awareness of the need for research and a systematic method of data collection are important to marketing success. Effective evaluation is ongoing, requires some money, and lots of times; but it is essential to protect your investment. Just like you would never invest in the stockmarket and ignore the market reports, you can't invest in an integrated teaching concept and ignore the data and evaluation. Data collection and evaluation should be an integral part of marketing by making it more effective and give you something to brag about.

Luann
by Greg Evans
CAN I HAVE A DIFFERENT GRADE?
SURE. LET'S MAKE IT AN 'A'
MR. FOGARTY, MAY I TALK TO YOU ABOUT THIS 'D' I GOT ON MY TEST?
CERTAINLY, LUANN
THE THING IS, I KNEW ALL THESE ANSWERS LAST NIGHT. MY DAD QUIZZED ME AND I GOT 100 %!
BUT BY THE TIME I GOT HERE - 16 HOURS LATER - I FORGOT HALF THE ANSWERS
AND TO BE HONEST, IF YOU TEST ME NEXT WEEK, I WON'T KNOW ANY OF THE ANSWERS!
AND BY THIS TIME NEXT YEAR, I'LL HAVE FORGOTTEN THE WHOLE TEST!!
AND WHEN I'M 45, I WON'T EVEN REMEMBER THIS CLASS!
WHAT'S THE POINT, LUANN?
WELL, THAT'S WHAT I'M WONDERING...

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"Imagine how inefficient and ineffective workers would be if jobs were organized the way most high schools are organized. People would have eight or nine different bosses. Every 44 minutes a bell would ring, and they'd have to stop what they were doing and go on to something else. People couldn't work together because that would be called cheating. And instead of dealing with problems as they arise in the real world, they'd have to deal with them one subject at a time."
—(Rex Brown, director of communications, Education Commission of the States)

Scheduling

"It's a great idea, but you can't schedule it." This statement is often times heard as school reform and innovative ideas are proposed to increase educational experience for students. Effective scheduling is considered by many educators as the supreme test of the administrators management skills. Many noble ideas have been lost in the rigidity of a schedule.

The development of a schedule is ultimately the translation of a school's purpose, curriculum, and decisions about grouping put into action. There is no end to the way a school can be scheduled. Computers have solved the technical problems of scheduling, however the five- or six-period day remains despite the creative efforts of innovators. What persists today is tradition. The purpose of the school, its curricular offerings, methods of student grouping and teaching modes should precede any scheduling considerations (English, F.W. 1989). Decision making should come first instead of being forced by a schedule.

Carroll (1994) contends that teachers cannot deal meaningfully with every student, every day under the traditional schedule. The typical method is: each teacher teaches five classes/day for 180 days. With an average class size of 25 students, that's 125 students each day.

A review of research on effective teaching indicates the key concept is individualized instruction. A typical student will be in nine locations pursuing nine different activities in a 6 1/2-hour school day. This schedule produces hectic, impersonal, inefficient instructional environment. Teachers can't teach well and students can't learn well. It is not about "block scheduling," but the relationship between time and learning.

Block Scheduling

Schools that have implemented block scheduling report that a 90-minute instructional block makes for a less frantic, chopped up school day. There is less movement in the halls and more time for learning. Teachers get to know students better as they spend more time with fewer students each semester. Students feel less stressed as they have fewer classes to keep track of and prepare for each day and it gives them the opportunity to work more with each teacher and their fellow students.

More time and depth is spent on each subject area in a 90-minute block than the traditional schedule. Students and teachers agree that block scheduling has opened the door to take more courses each year. As a result, enrollment has increased in many vocational areas and physical education.

The traditional seven-period schedule is just too rigid for many schools. Students aren't able to take all the courses they want, and teachers don't have the flexibility they need to experiment with multi-disciplinary and team-taught courses.

"I was pretty skeptical at first, but I decided to give it a try and it's unbelievable how well it worked," was Julian Smith's reaction to his first experience with block scheduling. Smith, a North Carolina teacher, indicates the key to successful teaching in a block schedule is being flexible and creative. Julie Howard agrees, "I try to use at least three different types of teaching during each 90-minute period. I've found that using more visual aids, including short videos, I can break up the period and keep the student's attention."

Seneca High School, Illinois, teachers Jess Maierhofer and Kent Weber teach in what is known as an "8-block" schedule. Students are enrolled in eight courses that meet every other day for 83 minutes. This schedule prompted Seneca High School to eliminate study halls and adopt a 34-minute homeroom period. Seneca has been using this schedule for six years and has recorded a significant increase in students GPA's. Perhaps more impressive, 93% of the students who were ranked in the lowest 10% of their class, doubled or tripled their GPA.

Hillcrest High School in Springfield, Missouri, modified a seven credit, eight-block schedule known as the "Hillcrest Plan." The "Hillcrest Plan" consists of a modified eight-block schedule that offers three features not found in most block scheduling: Seminar, Advisor, and Friday Closure.

Each Tuesday and Thursday, twenty students (five from each grade level) meet with a seminar advisor in a study hall situation.

Friday Closure gives classes the opportunity to meet for 43 minutes in order to "close" the week. One of the Friday 43-minute blocks is set aside for Advisor base in order to develop a closer group of students and teachers. Teachers appreciate the flexibility of working their discussions around general themes such as applying for jobs, studying for tests, world events and school news.

Principal, Dr. John Laurie, cautions,"It is important to note that if a consensus or a near consensus cannot be reached by the staff, this type of major restructuring project should not be undertaken. A major change like this cannot be imposed top down."

Teachers agreed to "throw out" the old lesson plans and teach with at least three different delivery styles each 85-minute block. Hillcrest found the best approach is a lecture that does not extend beyond 20 to 30 minutes. Principal Laurie adds, "This is a very new experience for marginal teachers. More effective teachers, however, had already taught several different ways during the old 55-minute class period.

More than 90 percent of the students, parents, and teachers at Hillcrest High School prefer the "Hillcrest Plan" over the traditional six-period day. Students who started in the block schedule have grades 23 percent higher than previous classes. Laurie claims students have made significant progress in honors and elective course enrollment because of the new schedule. The "Hillcrest Plan" is just one example how a staff modified a block schedule to meet the needs of its diverse population.

The old concept of a 50- or 55-minute lecture will not survive in a block schedule if done on a regular basis.

Advantages of Block Scheduling at Hillcrest High School

- Allows student more time to organize.
- Students have two evenings to complete homework.
- Less wasted time moving to and from classes.
- Fewer opportunities to be tardy.
- Longer class periods allow teachers to be more creative in their delivery.
- Time to teach different learning styles.
- Fewer discipline problems.
- Students see their worst class (teacher) every other day.
- Teachers see their worst class (student) every other day.
- Students and teachers seem to have much more energy at the end of the school day.

Research and articles published by those associated with block scheduling have shown positive results. Block scheduling proves to be more efficient, as less time is spent taking attendance, and getting

the class started and less time spent cleaning up and putting away supplies each day. Furthermore, it forces teachers to become better at planning, presenting, and reviewing lessons and concepts with students. Longer blocks of class time allow for more time to introduce a concept, reinforce learning through activities, demonstrations and experiments, and time for post laboratory activity discussion on problem solving.

As impressive as block scheduling may seem, all is not roses. Although block scheduling is effective for some classes, not all subject areas are best served with this arrangement. Some classes need to meet with students the full year, such as band, yearbook and language development. Programs of student organizations are an integral part of the instruction, may create communication challenges and may make it more difficult to maintain a regular contact with some students. Some schools have modified the 90-minute block into two - 50-minute blocks to better accommodate those classes that prefer daily contact with the students.

"A change in block scheduling must be accompanied by teacher in-service."

Another drawback to block scheduling is the effect of absent students. Because a teacher is covering essentially two days worth of material as compared to the traditional schedule, a student that misses a day of school is like missing two days of instruction. Students who transfer mid year that have come from a traditionally scheduled school may have trouble adjusting to a different schedule, catching up or transferring credits.

The biggest concern raised about block scheduling is, "Do students learn as well?" or "Do students learn as much?" Block scheduling was pilot tested in one Massachusetts school and a team of researchers from Harvard University compared block scheduling to traditional scheduling (control group). Although block scheduled students spent only 100 hours on a subject (compared to 139 for the control group) and had initial histories of lower academic achievement than the control group, the block students learned as well or as much as the control group. They also retained the knowledge longer than the control group.

Many reformers caution, time must be set aside each week for students and teachers to research and prepare for longer classes. Teachers that try to cram two of their former 55-minute lectures into a 90-minute period will only bore students. Teachers must be flexible and use more creative teaching methods. Classroom management is an important key to teaching in a block schedule.

Another commonly asked question, "Do you cover as much material in a block schedule?" The answer is "No." There are not as

many contact minutes. However, the advantage to this is that teachers tend to emphasize the really important concepts. It goes along with supporting the concept, "less is more." Once the teacher realizes how much the students do not understand, they try to resolve that understanding before moving on. Learning is more intense.

When you think about the evolution of a teacher, you can see how change can be difficult. Most teachers grew up in a school environment that constituted lectures in a 50- - 55-minute class period. When they went to college, they experienced a lecture in a 50-minute period. Teacher education taught them to teach using effective lectures in a 50- - 55-minute period of time. Most have been evaluated by administrators on their performance in a 50- - 55-minute lecture. And now we want to change the evolution of their teaching technique without inservice? Without proper inservice, we are setting teachers up to fail. Teachers that do not feel effective in a block scheduling environment will surely feel anxiety and create negative attitudes. A key to success of block-scheduling is teacher "buy in." When teachers learn the advantages of teaching in a block-scheduling environment, it focuses them to become better teachers. The bottom line is a benefit to the most important people of all— the students.

Block scheduling changes the way schools use time. Classes are taught in much longer periods, and meet only part of the school year. It is a means to create a classroom environment that fosters improved relationships between students and teachers and provides a much more manageable classload for both student and teacher.

Overall, teachers agree that block scheduling has improved their schools. However, teachers must be flexible, innovative and use more creative teaching methods along with improved classroom management.

Block Scheduling benefits allow students to...

1. Prepare for and attend fewer classes each day.
2. Spend more time researching, discussing and teaming.
3. Take more courses each year.
4. Plan a more flexible, individualized schedule to meet their educational needs.

A bit of surfing on the information superhighway linked us up with Roger Schoenstein, a foreign language teacher in Colorado Springs. Wasson High School went from the traditional seven-period day to a four-period block day. Here are some thoughts on block scheduling by Mr. Schoenstein.

1. **What are you doing within the block schedule?**

The block schedule allowed us to make many changes in our school, including interdisciplinary teaching. The block schedule drove interdisciplinary teaching, not interdisciplinary teaching driving the schedule. We first decided to go to block scheduling and from there, the schedule allowed us to do some interdisciplinary teaching.

2. **How did block scheduling drive integrated teaching?**

The pace slowed down, putting teachers in a reasonable working situation.

Teachers had more opportunity to meet and work together as a team. Their schedules worked in harmony causing them to formulate more ideas and work collaborate. From there, integrated teaching took place. Teaching methods changed, causing interdisciplinary teaching to take place. We didn't change the schedule to accommodate integrated teaching. Block scheduling automatically allowed for integrated teaching to take place. We set aside the old rules and change will cause this (integrated teaching) to happen. Change brings about other changes. Therefore, the change in scheduling was responsible for bringing about many other changes and one of those was more interdisciplinary teaching.

3. **To what do you attribute the success of your achievement scores?**

That's hard to say. As a teacher of 29 years, I can tell you that student achievement climbed. Students are more in tune to school and interested in their education. But you probably aren't interested in that. You may think that it is more anecdotal. Most people want to see a chart or graph to show proof that student achievement has increased. I hope you will take my word as a professional teacher with 29 years of experience that student achievement has increased because of the changes we've made. And although, I can't give you the hard data that you are looking for, I can give you better than that and that is experience in the profession. It's hard to segregate. One thing leads to another, which leads to another. "If you can test it, measure it, and put it on a graph - it isn't worth anything anyway."

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4. **Won't the absent student miss so much work in a block class that he/she will never catch up?**

When a student is absent, they do miss more from the block class than when they were absent from a traditional 50-minute class. However, they will now miss just four classes that given day versus six or seven. It is easier for the student to return to school and track down four teachers instead of six or seven.

A teacher usually has little or no time for trying to help a student "catch up" during the traditional 50-minute class. In a 90-minute block schedule, there ought to be time to meet with the student during the class period to fill him/her in on what they missed. The scenario, "I was gone yesterday, what did we do in class?" - usually gets answered, "See me after school and we can get you caught up?" Most of the time he/she would never come in after school to get caught up. Schoenstein responds, "If I can't find five minutes someplace during that 90 minutes, then something's wrong with my planning - too much 'sage on the stage' is going on."

5. **Does block scheduling prevent teachers from covering as much content as they could in traditional scheduling?**

Generally, teachers are covering less content than before. Covering less content, but the students still leave the class with more, not less, of the subject matter. A teacher may have "covered" ten chapters in the traditional 55-minute full-year class and only nine chapters in the 90-minute semester block, but the students leave the class with more from those nine chapters as involved learners, in groups, not just sitting while the teacher did all the work. Less content, but more mastery of that content. Therefore, less is more as the student leaves the class with more content knowledge.

6. **Are students able to earn more credits under the block system than a traditional schedule?**

That depends on what the school day and credits looked like before restructuring. We used to have a seven-period day. A student enrolled in six classes would earn twelve credits (six carnegie units) a year. Under the Block system, most students enrolled in four nine-week block classes each term. The result: They can earn sixteen credits/year (four classes each for four nine-week terms), or eight Carnegie units.

7. **Has the block schedule had an effect on school climate?**

   One of the benefits to restructuring is the reduction of stress on both student and staff. The block schedule with 90-minute classes and 15 minutes passing periods, has caused a dramatic change.

8. **Would you go back to a traditional 7-period day?**

   "I don't think I could anymore," stated Schoenstein. "It felt o.k. at the time - but having been on this schedule for four years now, I'd never go back. I'm excited about the effect that this change had on Wasson High and I just wish this had happened 23 years ago.

The Dade County Public Schools implemented block scheduling in nine elementary schools during the 1987-88 school year. All schools continued the block schedule through 1989-90. The innovation was designed to set aside larger blocks of uninterrupted time for instruction in basic skills. School staff were more satisfied with curriculum issues and student achievement scores were slightly higher.

A North Carolina high school (1987) implemented a new alternate-day schedule. Student course load increased from six daily 55-minute classes to eight 90-minute classes over two days. Units for graduation increased from 22 to 26 credits. As a result of the new scheduling, each department added one new course. Student enrollment is up in every department. The school boasts 92% of the student body is enrolled in a vocational education course. As a result of the scheduling, the number of students a teacher sees in a day is cut by one-third.

Vance County, North Carolina, did a study of the use of block scheduling in their two high schools. Teachers, students and parents were surveyed after a one-year pilot study of block scheduling. Sixty-seven percent (67%) of the teachers and 42% of the parents favored the block schedule. Only 26% of the students wanted to return to the traditional schedule.

Words of wisdom from the central office: plan carefully, involve all participants, go slow, make time for staff development prior to implementation and during the implementation process. Vance County spent three years implementing block scheduling - one year to study scheduling and two years of staff development.

Schools respond to state requirements by dividing time into blocks to parcel out specific responsibilities and to maintain accountability. Have you ever thought of following a student through a typical day at school? It is easy to forget how, 6-8 times a day, students jump out of their seats every 40-50 minutes and rush to

Wasson High School teachers held a mock funeral for traditional 7-period schedule.

"The Funeral"

- May they rest in peace...
  - -the 7-period day
  - -one teacher, 150 kids
  - -the paper load
  - -class size of 30 plus
  - -20 minutes lunch/indigestion
  - -the isolation
  - -the number of dropouts
  - -the number of failures
  - -the number of tardies and truancies
  - -negative student attitudes about learning
  - -poor student morale
  - -scheduling limitations
  - -not knowing our own students

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another classroom, another seat, another subject, another teacher, another set of students. The fragmentation of the day only compounds the dilemma as students never have the chance to explore a subject in depth, never have the chance to "make the connection."

As Wasson High School experiences, "If you block it (scheduling) they (integrated academics) will come." Block scheduling can be the catalyst to integrated academics. Teachers will have the opportunity to plan lessons that fit the needs of their students rather than fit the needs of a 40-minute time block.

Pick a new schedule because it addresses areas of concern that you have identified in your school. Don't choose a schedule just because teachers like it, or it sounds fun - choose it because it fixes the things you want to fix. Numbers must be heeded. Pay careful attention to state mandated minutes of instruction, maximum numbers of students that teachers can encounter in any given day or year, and total minutes a teacher can be required to teach.

"The only limitation to possibilities of academic integration lie in the minds of the professional educators. Daily lives are not separated into periods or blocks, and education needs to be more responsive to the daily life that will face students upon graduation. Integration allows for a common sense approach that assists students in understanding the need for logical learning."

-Gary Maricle

A school system that is directed towards meeting the educational goals of all students should not establish scheduling procedures that inhibit the individual student's achievement of legitimate personal educational goals. Scheduling has frequently been identified as the reason why many students can not enroll in a given course or offering. Alternative scheduling suggestions are:

1. Operate programs on a 7- or 8-period day, thus allowing additional times or opportunities.
2. Open evening and Saturday classes to regularly enrolled students.
3. Offering courses during out-of-school hours over local educational television facilities.
4. Conducting mini courses in and outside of the regularly scheduled school day.
5. Conducting summer programs with broad student access priorities.

Scheduling Examples

Several innovative scheduling models are in existence with a variety of patterns and modifications. For more details on each of these schedules, see Scheduling the Secondary School (ED 254 963) by: Richard A. Dempsey & Henry P. Traverson and/or Rethinking Reform: The Principal's Dilemma (ED 277 125) by: Fenwick W. English and others. Available from: NASSP, 1904 Association Drive, Reston, VA 22091, (703) 860-0200:

1. Traditional
2. Flexible modular
3. Conventional modular
4. Rotating period
5. Single-double rotation
6. Block of time
7. Modified block
8. Fluid block
9. Mini-course
10. Large-group, small-group, individual study
11. Pontoon-transition
12. Individual master
13. Individual student
14. Copernican plan (intensive)
15. Integrated model

An integration model of secondary school curriculum that includes three conceptual approaches (Cawelti, 1974):

1.) Academics
2.) Aesthetics
3.) Athletics

Cawelti's model contends there is only one curriculum that is totally integrative in a student's experience. The model erases the line distinctions and combines curricula and cocurricula. The model recognizes five basic high school clusters to be integrated into the conceptual approaches:

1.) Learning skills
2.) Health, physical education and leisure
3.) Career education

4.) CULTURAL STUDIES

5.) SOCIETAL SKILLS

The school's socialization role in society has been overlooked in recent national reform reports. English (1986) contends the socialization process is an aspect of cocurriculum that is an important segment to encouraging participation of large numbers of students.

A Model for the Integration of the High School Curriculum

CAWELTTS CURRICULUM CLUSTERS	ACADEMICS	AESTHETICS	ATHLETICS
LEARNING SKILLS	MATH READING LISTENING WRITING PROBLEM SOLVING	TECHNIQUES TO PERFORM	SKILLS REQUIRED TO PLAY, COMPETE
HEALTH, PE, AND LEISURE	SCIENCE HEALTH HAZARDS	APPRECIATION ALTERNATIVE LIFESTYLES	PHYSICAL DEVELOPMENT LIFETIME SPORTS
CAREER EDUCATION	WORK ETHICS DIGNITY OF WORK	AESTHETICS OF WORK	DISCIPLINE POISE SELF-CONFIDENCE LEADERSHIP
CULTURAL STUDIES	ETHNIC STUDIES HUMANITIES	ART MUSIC THEATER ARCHITECTURE	VIEWS OF GAMES PLAY COMPETITION
SOCIETAL SKILLS	CIVICS HISTORY ECONOMICS	FASHIONS LIFESTYLES LEISURE ACTIVITIES	PHYSICAL FITNESS INTERPERSONAL SKILLS LEADERSHIP DEPENDENCY FRIENDSHIPS

Notes: (1) The curriculum clusters were extrapolated from G. Caweltt, Vitalizing the High School (ASCD, 1974)
(2) The model is used with permission from Educational Research Service. It appeared in F. English, "Balance in the School Curriculum: Today's Directions and Dilemmas," (ERS, *Spectrum*, Winter 1986).

The Copernican Plan is a popular time organizational schedule about the relationship between time and learning. As opposed to the traditional five classes a day (approximately 125 students per day) for 180 days a year, the Copernican Plan proposes 90-minute and up to four-hour class periods which meet for only part of the school year (30, 45, 60, or 90 days). Students are enrolled in fewer classes each day and teachers deal with fewer classes and students each day. Improvement of relationships between teachers and students with much more manageable workloads will result in more successful schools. The Copernican Plan:

1. decreases an average class size by 20%
2. increases course offerings by 20%
3. reduces number of students a teacher works with each day by 60% to 80%
4. provides students with seminars dealing with complex issues
5. establishes a flexible, productive instructional environment
6. increases student mastery by 25% to 30% more
7. keeps within approximate funding levels
8. increases student problem-solving skills

The Copernican Plan uses an 85-minute - five-period day where students complete their courses in one semester. This program is also called "Intensive Scheduling."

The Hillcrest Plan

Monday	*Tuesday*	*Wednesday*	*Thursday*	*Friday*
1	2	1	2	1
				2
3	Seminar	3	Seminar	3
				Advisor Base
5	6	5	6	5
				6
7	8	7	8	7
				8

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The Hillcrest Plan

Hillcrest High School in Springfield, Missouri, expanded their schedule from a six- to a seven-credit format. Teachers teach five 85-minute classes each day, plus a seminar class. The "Hillcrest Plan" is unique in that it includes three features not found in most block schedules: 1) Seminar 2) Advisor Base and 3) Friday closure. The Friday closure gives all classes the opportunity to meet 43 minutes on Friday in order to "close" the week.

The Hillcrest Plan
7 Credit, Modified 8 Block Schedule
A Learner-Centered Schedule which includes

- M/W - four 85-minute classes
- Tu/Th - three 85-minute classes
- Tu/Th - one 85-minute Seminar
- Fri - seven 43-minute classes
- Fri - one 43-minute Advisor Base

The Hillcrest Plan

Monday	*Tuesday*	*Wednesday*	*Thursday*	*Friday*
1	2	1	2	1
				2
3	Seminar	3	Seminar	3
				Advisor Base
5	6	5	6	5
				6
7	8	7	8	7
				8

The Flexible Modular Schedule is one of the most popular scheduling examples. The unlimited choices in time patterns within the same subject area, allows course scheduling to meet a variety of different ways. Certain subjects can be scheduled into 75- to 90-minute blocks that meet on alternate days of the cycle.

Student Flexible Modular Schedule – Six-day Cycle

Models	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6
1	ENGLISH 10 Large Group		AMERICAN HISTORY Small Group	BIOLOGY	SPANISH II	
2		GEOMETRY				
3						
4						ENGLISH 10 Small Group
5		SPANISH II		AMERICAN HISTORY Small Group	BIOLOGY	
6						
7	GEOMETRY					GEOMETRY
8						
9		ENGLISH 10 Small Group	GEOMETRY		PHYSICAL EDUCATION	
10						BIOLOGY LAB
11	SPANISH II	LUNCH				
12		LUNCH	LUNCH		AMERICAN HISTORY	
13	LUNCH		LUNCH	LUNCH		
14	LUNCH	AMERICAN HISTORY Large Group	ENGLISH 10 Small Group	LUNCH		
15				GEOMETRY	LUNCH	LUNCH
16	BIOLOGY				LUNCH	LUNCH
17			SPANISH II			
18					ENGLISH 10	
19	PHYSICAL EDUCATION			SPANISH I		
20			PHYSICAL EDUCATION			SPANISH II
21		BIOLOGY LAB				
22					GEOMETRY	
23	AMERICAN HISTORY					
24						

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The Pontoon-Transitional Schedule is a variation of the Block-of-Time Schedule (Georgiades, 1970). This schedule is intended to integrate two or more subjects from related or unrelated disciplines. Teacher teams are utilized to organize large-group presentations, small-group discussions, team teaching, and individualized study in a flexible block of time. A Pontoon can incorporate from two to six disciplines. The basic Pontoon is based upon the following formulas:

- Two Subjects/Teachers/Periods = 2 X Class Size + 10
- Three Subjects/Teachers/Periods = 3 X Class Size + 10

Example: If class size is 25 students, a three-subject pontoon would have two teachers working with 85 students (3 X 25 + 10) in three back-to-back class periods.

One or more pontoons may be employed without disturbing the basic schedule of the school, and can add as many more pontoons as desired.

Pontoon-Transitional Schedule

Day 1	11:55-12:00	12:05-1:20		1:25-2:35	
Biology	Large-Group	AB		CD	
English	Roll Call Only	12:05-12:40 CD	12:45-1:20 EF	1:25-1:55 AB	2:00-2:35 GH
Geometry		EF	CD	GH	
Directed Study		GH		EF	

Day 2	11:55-12:00	12:05-1:20		1:25-2:35	
Biology	Large-Group	EF		GH	
English	Roll Call Only	12:05-12:40 GH	12:45-1:20 CD	1:25-1:55 EF	2:00-2:35 AB
Geometry		CD	GH	AB	
Directed Study		AB		CD	

Thayer Junior-Senior High School, in Southwestern New Hampshire is attended by approximately 300 secondary students. Thayer's schedule is somewhat conventional as it's schedule includes six 50-minute periods with courses that run the entire year. However, the schedule provides flexibility for teachers. During the team periods, teachers use any organizational arrangement of students, teachers, time and space. Each team runs a separate schedule, which varies from week to week.

Thayer High School: 9th Grade Team Schedule

	Mon	Tue	Wed	Thu	Fri
7:50	Advisory Meeting	Advisory Meeting	Advisory Meeting	Advisory Meeting	Advisory Meeting
8:00 1st	Out-of-team class for 9th Grade Team teachers (4) and all ninth grade students				
8:54 2nd–3rd	9th grade team class for 9th Grade Team teachers (4) and all ninth grade students				
10:38	Lunch	Lunch	Lunch	Lunch	Lunch
11:05 4th	9th grade team class for 9th Grade Team teachers (4) and all ninth grade students				
12:00 Band Period	Band, other activities, tutoring				
12:43 5th	9th grade team class for 9th Grade Team teachers (4) and all ninth grade students				
1:35 6th	Planning time for 9th Grade Team members (4), out-of-team class for 9th grade students				

During the Team periods, teachers may use any organizational arrangement of students, teachers, time, and space they wish. In effect, each grade level team runs a separate team cohesive for its students and staff within the larger school schedule.

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The Fluid Block Schedule (Ubben, 1976) increases flexibility without loss of student accountability. This schedule groups students and teams of teachers for large segments of instructional time for up to three hours a day. The scheduler assigns a group of students to a particular team, the team designates an advisor for each student. The advisor assists each student in planning a course of study for half of a school day with the remainder of the school day dedicated to more of the college prep type courses or vocational courses. The Fluid Block Schedule may include open labs, individualized instruction, mini-courses and large- and small-group activities.

Fluid Block Schedule

2 Language Arts + 2 Social Studies Teachers

Basic Schedule

Hour 1 Hour 2 Hour 3	Fluid Block 100-120 Students	Music Lab	Math Lab	Driver's Education	Foreign Language	Art	Drama	Typing	Etc.
Hour 4 Hour 5 Hour 6	1 hour elective 1 hour elective 1 hour elective	or	Three hour Vocational Block						

3 Language Arts - 3 Social Studies Teachers

Mini-Course Schedule

	LA	LA	SS	SS	LA	LA	SS	SS	LA	LA	SS	SS	Individual Labs
Hour 1	Mini-Courses	Mini-Courses	Mini-Courses	Mini-Courses	Planning				Courses	Courses	Courses	Courses	Music Lab Math Lab Driver's Education Foreign Language Art Drama
Hour 2					Mini-Courses	Mini-Courses	Mini-Courses	Mini-Courses	Planning				
Hour 3	Planning								Mini-	Mini-	Mini-	Mini-	

Large-Group, Small-Group, Individual Study Schedule

Large-Group (120)					Individualized Labs
Small-Groups	15	15	15	15	
Small-Groups	15	15	15	15	(60)

The **Block of Time Schedule** is aligned so two subjects can meet for a double period two or three times each week. The pattern can vary on alternate weeks to provide equal time for each subject. The example below depicts part of a regular schedule illustrating music and art meeting for a double period.

Block Schedule; Five-Day Cycle

	Monday	Tuesday	Wednesday	Thursday	Friday
1	ART	MUSIC	ART	MUSIC	ART
2	ART	MUSIC	ART	MUSIC	ART

The **Modified Block Schedule** is a modification of the Basic Block of Time Schedule. Subjects may meet for one single and two double blocks during the five-day cycle.

Modified Block Schedule; Five-Day Cycle

	Monday	Tuesday	Wednesday	Thursday	Friday
1	ART	MUSIC	ART	MUSIC	ART
2	ART	MUSIC	ART	MUSIC	MUSIC

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Time

"When I try to apply and make all of the math relevant and connected to real life, it takes a whole lot more time than if I say, 'alright students,' here's how we do this or that." **Hallsville teacher Cecil Baugh** pretty much sums up what we've heard from most teachers we interviewed in our case studies. Finding the time is a problem when restructuring the curriculum for integrated teaching.

When asked what was the most difficult about integrated teaching, the unanimous response is, "finding time to plan together." Time for planning, implementing, and maintaining is essential when teaching an integrated curriculum. Teachers and administrators at every case-study site mentioned time as a major constraint. Teachers were not given enough time during the regular school year or summer to prepare for integrated curriculum or teaching practices.

The amount of time spent planning varied from one week, to one month. Integrated teaching requires training teachers in different teaching methods. Time for staff development is necessary as true change in teaching methods requires teacher training. One teacher's answer to "When do you find time?" "Rarely...we did have some inservice days that the board voted to dismiss kids at 2:30, and we worked on curriculum and integration; some inservice days were allotted. We just can't get together if our planning periods aren't the same."

Time... Our most valuable resource, yet our least common asset

Unfortunately, time translates directly into funding concerns. Efforts at integration will rise according to funding available. Local monies or grants help to provide additional funds needed to increase the curriculum improvement effort. When funds subside, so do efforts. Schools need enough time to acclimate themselves to the change. Integrated teaching can take years to fully implement, even under the best conditions.

How to make time for teachers to develop integrated teaching

Faculty meeting time - faculty meetings focus on collaboration and planning rather than administrative details. Effective use of faculty notices will free up time for planning integrated teaching.

Common time - Specific teacher groups are scheduled to have

the same preparation period each day.

Efficient time - Faculty meetings deal exclusively with planning rather than announcements or administrative trivia.

Paid time - Teachers are paid for spending vacation days or summer time on curriculum work. A district or school fund is established to pay substitutes to take over classes.

Early release time - Each class period is shortened by a few minutes so students can be released for a partial day of teacher planning.

Team time - In team teaching, team members alternate between teaching and planning.

Weekly release time - Students are released early one day each week so teacher teams may plan together.

Volunteer time - Student teachers, parents, community members, volunteers, or administrators take on or assist with teacher tasks or classes freeing up the teacher for team meetings or planning time. Another possibility in elementary grades is to have older students regularly tutor or coach younger ones.

Credit time - Teachers are compensated in new ways, such as in-service credit for using their own time.

Substitute time - Larger school districts may increase class size by just one or two students to provide a surplus to finance teams of substitute teachers. The substitutes can cover classes on a regular basis, allowing teacher teams to meet more frequently. Caution: Teacher buy-in to this concept is extremely important.

Rescheduled time - the school calendar is revised to provide more teacher planning days. Some schools are going to four-day weeks with the fifth day for teacher planning or club meetings.

School day time - Reconstruct the schedule to build meetings into the regular school day. Teachers are usually tired and non-productive during 4:00 meetings. Meetings during the day result in productivity and efficient use of meeting time.

Grants - Grants to initiate collaboration and bring interested teachers together at a retreat away from school can result in effective planning time.

"Having a common planning period is essential to the success of our program. All four teachers meet every day during school, so that no problem gets out of hand. We're fortunate to have four back-to-back blocked periods, and classes held in nearby classrooms. But the success of the program is in the meeting periods."

-Tammy Bishop, Kansas City

Some ideas adapted from: The National Center for Innovation of the National Education Agency.

Planning time is an important element in integrated teaching.

Teachers use planning time to convert the school mission to more specific curricular goals. Time for staff development is necessary for successful integrated teaching. Teachers must receive proper inservice education in new teaching methods.

Here are some examples how schools across the nation are finding time for staff collaboration

1. To give teachers a full 90 minutes of shared time, an elementary school schedules teaching teams for the same daily lunch period followed directly by a common preparation period.

2. To encourage collaboration time for teachers, some districts are rescheduling day-long staff development meetings. Math it out and five staff-development days permit 13 two-hour sessions. This would permit a two-hour collaboration time every two weeks throughout the school year.

3. In Kentucky, the State Board of Education sought legislative permission to convert five of the required instructional days into staff development time ("states" 1992).

4. The Texas Commissioner of Education sought authority from the Legislature to waive up to 15 instructional days to make them available for staff development (Gursky, 1991).

5. The principal in one elementary school offered to dismiss classes 45 minutes early each Monday, Wednesday, and Friday if teachers would extend the time by contributing 45 minutes of their own.

6. Some schools have lengthened the school day minutes and dismissed students at noon on the fifth day. One Rhode Island superintendent made Wednesdays teacher meeting days and persuaded local churches to hold their religious education programs on Wednesday afternoon. The superintendent also persuaded other youth activities to meet on Wednesday afternoons.

7. "Creative interpretation" of state requirements for instruction is

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how one New York City superintendent describes how he found time for teacher team collaboration. He discovered that the time requirements could be met in four classes per week. By meeting four times per week, thus permitting the blocking of classes such as physical education, art, music, etc., on the fifth day. On Fridays a particular group of students may take two periods of physical education, followed by one each of music and art. This configuration frees certain teachers for collaborative planning time one day each week.

8. In Ft. Myers, Florida, a new teacher contract set the workday for teachers at an hour longer than that for students. This leaves time after school each day for teachers to meet.

9. Although not popular among teachers in the United States, Asian schools increase the class size to provide time for teacher collaboration. Class sizes are much larger than ours, but the total ratio of teachers to students is quite similar because teachers teach fewer classes. American teachers and educational leaders generally agree that larger class sizes is not effective teaching.

Administrators and parents are reluctant when teachers are out of the classroom to receive inservice. However, true change in teaching methods will not happen without proper inservice training and planning time. One administrator mentioned,.."it takes time to plan and implement. You need time to inservice your staff and time for them to feel comfortable with what they are trying to do. We must remember, change takes time. We are trying to change methods of classroom instruction that have been going on for a long, long, time. Not only have teachers been teaching the traditional methods for their whole career, but that is the way they were taught when they were in school and the way they were taught to teach. I believe good inservice of integrated academics takes two years before teachers should even start to implement."

Integrating academics calls for innovativeness on the part of the teacher. Policies and practices that constraint teacher's classroom activities are going to inhibit their capacity for innovation. Policies that shape or absorb teacher's teaching and planning time are a source of concern of teachers in integration. Teachers want more control over the way their day, week, and year are scheduled and more opportunities to work with each other to develop curriculum and enhance teaming efforts.

Major change is a time-consuming arduous process, which often starts with minor alterations that may gradually mushroom into bolder reform.

Research suggests that collaboration time is necessary for effective instruction and performance. We must remember that time must be allocated for continuous collaboration. Once teachers are trained and programs are established, collaboration time must continue for faculty to reflect together and continue to develop solid teaching practices.

Finding time can be answered in many ways, left to the discretion and innovativeness of the school. Time can be scheduled by three different entities:

1. The school - Building administrators can make time for teachers by individual scheduling or planning periods.
2. The district - Districts can adopt policies for teacher time by rescheduling the school day or building in staff time on teacher contracts.
3. The state level - Lobbying for legislative support to build in teacher collaboration time has been successful in some states.

There is a big difference between quality time and quantity time. Make sure teachers are given quality time to collaborate and develop integrated lessons and units of instruction. Giving teachers time to collaborate at the end of the school day is unproductive time. Teachers are tired after a long day resulting in poor quality time. Blocks of time are most productive for quality time. Building small time segments into the school day is not good use of time. About the time the integrated teaching team really gets down to work and developing ideas, the collaboration time is over and many ideas are left dangling.

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Teaming

Teaching teams in this context refers to collaborative teams of teachers. When we address teaching teams, we are talking about a more fundamental structure than the team teaching that was popular in the 1960's and early 1970's. According to Lounsbury (1992) team organization is defined by four organizational aspects:

1. Common planning time
2. Shared students
3. A common block-of-time
4. Common team space in adjacent classrooms and connecting hallways

How can building teaching teams benefit students and the school? Teachers are better prepared to support one another's strengths and accommodate their weaknesses. Therefore, teachers as well as students gain confidence and knowledge of what is taught in an integrated unit. A Hallsville teacher mentioned, "I'm able to try projects I would probably not try on my own. I always wanted to do this, but I was never really willing to take on the whole project by myself."

Integration requires new relationships between individual teachers and among groups of teachers. Teacher teaming supports integration in several ways. First, teacher's roles and relationships must change to develop curriculum and teaching practices. Teachers need to work in interdisciplinary teams to develop curriculum and practices. Collaboration to develop classroom activities and develop an integrated program was an important segment mentioned by teachers attempting to integrate. If an integrated curriculum had existed, teachers responded that they would still need to collaborate to develop skills and a knowledge base in different subject areas. Neatly packaged curriculum materials are no substitute to interactions with colleagues on specific lesson plans.

Teachers learn to value each other by mixing with and understanding the contributions made by each individual. Relationships must be built between individual teachers and among groups of teachers. Integrated teaching is supported by strong teacher-to-teacher relationships in several ways. **Social studies teacher, Charles Cole**, of Farmington stresses, "You need to understand that

your discipline isn't the most important. I have developed a greater appreciation for science over the past two years. You value each other and by mixing with and understanding the contributions made by each individual." Teacher collaboration provides the opportunity for increasing the value placed on all teachers and all students.

How do you build an effective integrated teaching team? "You've got to have team ownership," one Kansas City East teacher states. "Teams have to be formed with consent of all members . . . attitude and ownership. If you don't have a team, you're going to have trouble. It'll kill you.

A common planning period is necessary, every single day."

Industry tells us that being a team player is important. Long ago, industry realized that effective teams must go through a "bonding" process. Team building is essential if integrated learning is going to reach maximum results. **Hickman Senior High teachers Peggy White and Jim Kyd** agree, ". . . the bottom line is: the real bedrock you have to stand on as a team teacher is that you have a true belief in the philosophy of empowering students. If you have real dissonant viewpoints, I don't think the team's going to stay together." You don't have to have compatible personalities, but you must have compatible teaching philosophies as far as what you want for students. That's crucial."

Teaming is a bit different for **Doug and Craig, two Jefferson Junior High teachers** that have teamed together to integrate science and technology. They feel the key component to any integration is personalities. Doug and Craig are good friends - they share the same hobbies and work together outside of school. Craig comments, "When teachers say 'it's so much more work than what I was doing,' I think it's because you have a possible personality conflict. I think that is the key to success."

Dr. Carrol Gilles, University of Missouri professor and veteran teacher, contends that teachers may have the same teaching philosophy and be the best of friends, but may not survive as an integrated teaching team because of organization or more specifically lesson planning. Dr. Gilles speaks from experience. Her teaching team dissolved because of differing views on lesson planning. If one teaching partner needs structured lesson plans and the other is the sort of "shoot from the hip kind of guy," it generally causes problems with that team.

Team building also helps the teacher develop as a professional. From a teaching standpoint, **Rich Trinklein (Hallsville)** says, "The biggest benefit for me is that I've had to force myself to communicate with other professionals . . . it makes me a more well-rounded teacher."

"The nature of the challenges facing education today makes teamwork essential if we are to respond to these needs. Teamwork produces a collaborate spirit where success is the ultimate product. Teamwork promotes educational efficiency by allowing the transfer of vision, creativity, and innovation. It promotes communication, and with it more understanding among team members. Through teamwork everyone in the system has not only a responsibility but a support system to help them with that responsibility."

-Ralph Gourse

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What about the student? Does teaming benefit the student? Some students don't like the idea. "Now they talk about me all the time," one student mentioned. "It isn't as easy to get lost in the crowd." Teachers are more likely to notice a student who is having problems. Did you ever have one of those students that gave you a hard time one day and if you would have known what happened in a prior class or another teacher might have clued you in, you might not have over-reacted? Or better yet, the insight might have prevented the problem from turning into a war. Chances are, as a team, teachers can pick up and attempt to solve the problem before the student "falls through the cracks." Therefore, the team supports the student no matter what their achievement level.

Students recognize the comraderee of the team and begin to feel part of the team themselves. This may not be the situation at first. Students will try to play one teacher against the other - just as they do at home with Mom and Dad. After they realize the "power of the team," they will begin to understand that breaking down a team is not any easy task. Students will realize it is better to work with the team than try to fight it. Soon they will join the team because they realize it is to their benefit.

"Empowering teachers is very important." According to a National Center for Research in Vocational Education (NCRVE, 1993) study, introducing new staffing patterns and altering the school structure, helped to develop new teacher-to-teacher interactions. These changes included: hiring new teachers, assigning teachers to work together to develop curriculum, providing joint planning periods and instructional times, workshops, opportunities for teachers to observe each other during instructional periods to learn from each other, and new governance structures. NCRVE reported schools changed their organizations to increase teacher input into curriculum decisions and to ensure interaction by providing the organizational structure needed for teacher interaction.

According to Drake (1993) teachers representing an ideal curriculum writing team:

- Volunteer for the projects
- Are willing to implement the product
- Love teaching and students
- Are willing to learn
- Are risk takers
- Demonstrate interpersonal skills
- Perceive the teacher as a facilitator
- Are generalists who love a specialized area
- Are specialists interested in a generalized area
- Are innovative and creative
- Have taught several subjects
- Are technologically literate

Pressure through interaction with peers as well as administrative leaders facilitates successful change. Teachers who are not fully committed to the team concept will need to feel positive pressure from those enthusiastic about the integrated concept. Negative peer pressure from teachers opposed to the teaming concept could deter integrated teaching if left unchecked. Administrators and team leaders must work hard to insure that peer pressure is positive, supportive, nurturing, and understanding.

St. Charles School District Assistant Superintendent Dr. John Urkevich emphasizes the role of the building principal in teaming.

> The role played by the building principal is most vital to team teaching success. The principal, more than anyone, must provide the organizational structure and establish the expected parameters in which an integrated planning team can operate. This can and should be done with input from affected staff, but it must be done prior to implementation in order for integrated instruction to work effectively. All too often, great ideas never reach fruition due to poor planning and lack of structure. Things work because people make them work and they work best when people understand the expectations and limits up-front. The principal is the one to provide this sense of direction.
>
> Once the structure is provided and planning and implementation activities have begun, the principal must monitor, observe and provide feedback to teachers. The principal should display

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patience. Things often don't work as expected the first time through. The support and encouragement of the principal is vital to ensure that integrated teaching doesn't collapse of its own weight due to teacher frustration. The principal must be the school's biggest cheerleader for this concept.

Finally, the principal must realize and impact to the faculty, that they must be problem solvers when trying to team teach. When implementation of new ideas runs into tough times, teachers often go to the principal and say, "What should we do?" If principals supply the answers too often, then the teachers have absolved themselves from ownership and the concept becomes "the principal's thing." A good leader will encourage staff to not just come with the problem, but also a proposed solution. This way, ownership stays where it belongs, collaboration increases, and mutual professional respect is enhanced.

The principal should meet with team leaders on a regular basis to ensure good communication. Meeting with the teams from time to time will provide an opportunity for the principal to see the personalities of each team, react with individual teachers, and observe the team as a whole.

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Administrative Support

In most cases, the principal plays a key role in the development of an integrated curriculum. Ultimately the principal or superintendent is the person who must articulate and defend the vision of what the school is trying to accomplish. As the "Vision Gatekeeper," the principal is continually called upon to defend the school's goals. An effective principal formulates a shared goal of integrated teaching with their staff. The principal must be articulate and able to defend the mission and goals of the school. The principal can make integrated concept a reality by:

- Securing funding for summer work for staff members interested in integrated teaching.
- Providing planning time for teachers to work collaboratively.
- Developing a schedule that supports integrated teaching.
- Selecting new staff members that are interested in teaching in an integrated curriculum.
- Respecting the difference in readiness among staff.
- Supporting the teacher's professional judgment about how to best support integrated teaching.
- Developing a trust with the teachers as to the principals' commitment to the integrated concept.
- Learning from and with the faculty as the integration process proceeds.
- Showing a true commitment and active interest in the restructuring effort.
- Developing a commitment for the long run and developing a long range plan to develop the goals and mission of the school.
- Developing good rapport and establishing community input into the restructuring process.
- Assessing the use of integrated teaching.

The principal's duties as a change agent in the school will not be effective unless there is a shared understanding of the purpose, rationale, and process of the integrated concept. Educational change often fails because there is not a shared vision of the mission and goals.

The principal must model pedagogical techniques, show how subject matter can be integrated, and teach necessary group-process skills.

Weary, Leery, and Wary

To many folks, change doesn't come easy. Administrators must be aware of the terrible triplets of change - weary, leery, and wary. Staff members may be weary of being taken out of their comfort zone for another "school reform initiative," wary of the personal effects of change, and leery of administrative motives for change.

While change may be welcomed by some, more often it causes concern and apprehension among staff members. Some teachers will welcome the integrated concept; others will fear loss of personal power or self governance. The instructional leader will give teachers the empowerment to change. An increase in teacher empowerment and decision-making must be demonstrated during the early stages of the integrated restructuring. Traditional closed classrooms have fostered a sense of empowerment by teachers. The isolation and control of each teacher operating their own classroom fosters a sense of security. Effective administrators reassure teachers that integrated teaching empowers teachers to help students make connections.

"It is impossible to change without improving; it is impossible to improve without changing."

-J. Carroll

Teachers become leery of moving into subject areas in which they have no track record of expertise in that area. Integrated teaching requires teachers to go beyond their subject area and investigate education as a whole. Some teachers will be teaching in areas they have not studied or they lack familiarity or knowledge. Administrators must realize and assist in making the transition an enjoyable experience for teachers. Training time will be necessary for teachers to become familiar with their new teaching experience. Without a supportive environment, teachers will become frustrated and return to their old beliefs and teaching methods.

Others may not see the administrator's vision of seizing the opportunity. Some teachers may infer there is a hidden agenda to the integrated concept or that we are desperate and trying something for the sake of change. Rather than focus on an opportunity to do things differently, some teachers will seek out the negative. Some veteran faculty members may be wary about personal status. Too many veteran teachers have already developed a callous attitude because of the number of educational reform methods they have already experienced in their life time. If all the time and effort results in failure, teachers will become more cynical and wary of change.

Administrators must develop trust in their teaching staff that they really believe in the integrated concept and are interested in integrating for the good of the students. The administrator must set a democratic mode of operation where teachers feel their voice can make a difference. It is then, that teachers can express their conflicts and use their energy to find solutions.

All in all, the best vehicle for change in the teaching staff is when the idea comes from the grass roots level. A grass roots approach will include teachers more directly in the decision-making process. Real success is more certain if teachers are the ones demanding the change. Time limitations may not allow for a push coming from the grass-roots.

Drake (1993) defines leadership characteristics essential in developing integrated curriculum as:

- KNOWLEDGEABLE ABOUT THE PROCESS
- MAKES PEOPLE FEEL COMFORTABLE
- HAS INTERPERSONAL SKILLS
- FACILITATES LEADERSHIP EVOLVING INTO COLLABORATIVE SHARED ROLES
- ENVISIONS THE BIG PICTURE
- ASSISTS THE TEAM IN ESTABLISHING ITS OWN VOICE AND DOING IT THEIR WAY.
- ALLOWS TIME FOR TEAM MEMBERS TO TALK RATHER THAN DOING ALL OF THE TALKING
- CAN IDENTIFY AND ARTICULATE GROUP PATTERNS
- SYNTHESIZES THE "RAMBLINGS" OF A GROUP
- TAKES RESPONSIBILITY FOR THE FINAL PRODUCT

To integrate successfully, you ve to be willing to take the heat d stay the course. Excitement d enthusiasm will carry you bout 30 days. Dedication ill take you the rest of the ay."

Inservice is also very important help staff develop the skills ey need. Teachers have to ve a broader knowledge base, t not as deep a base as before. hey have to have extremely ood interpersonal relationship kills, more flexibility, more lerance for chaos, technical kills, and the ability to facilitate. Cold inservice meetings in the orning, not at night when eryone is tired."

Ralph Powell, Hallsville

The principal must have a vision of a school with an integrated curriculum. Developing a knowledge of the integrated concept is essential to the leadership position. This does not mean the principal must actively participate in curriculum planning and implementation. It may be beneficial to trust the teachers' expertise, intuitions, and innovativeness. Instead, an effective principal can offer a supportive environment, provide money and resources, arrange for collaboration and planning time, and provide a listening block for involved teacher teams. The principal should encourage risk-taking and learning by mistakes. Teachers must see that the principal is solidly behind their endeavors and the school functions as a team.

There comes a point in time of the restructuring effort when the administration must answer the question, "Is integrated teaching working? Is it worth the time, money, and effort?" Answers to these

questions require valid data. Administrators must execute evaluation Research techniques to find answers to these ever important questions. Parents, school board members, administrators, and teachers make serious decisions on how they will operate a school. Valid data will prevent them from making the decisions in a vacuum.

Reference

Drake, S. M. (1993). *Planning integrated curriculum: The call to adventure*. Association for Supervision and Curriculum Development. Alexandria, VA.

Vehicles for Integration

There are possibly as many ways to deliver integration as there are forms of integration. From thematic units to applied courses, teachers have a wide variety of contexts available within which to package their ideas. This section will outline many delivery structures. Some of the structures will seem more applicable to one grade range than others (e.g., elementary schools or high schools); some will enter the picture from the academic side, while others will enter from the vocational side; some will seem to require major changes in the way a school is organized, while others will seem to require fairly minor shifts in teachers' thinking about curriculum, instruction, and assessment. Regardless of the particular kind of integration or its particular orientation, integration in its simplest form is nothing more than good, sound teaching practice—making abstract concepts more understandable by applying them to real-life situations. It exhibits potential to reinforce students' acquisition of basic and higher-order academic skills, to enhance the rigor and completeness of occupational skill training, and to renew the way in which both academic and vocational education are delivered.

All of the models share several features that are common to all integration activities:

- All emphasize that "students should develop the skills, knowledge, and attitudes necessary for achieving success in institutions of higher learning, entering the work force, and functioning as responsible and productive citizens" and that "if students are able to realize the relationships between what they are required to learn and its relevancy to the real world, they are more motivated. As a result of higher motivation and satisfaction, students perform well academically and at the same time acquire marketable skills." (Mission Statement of the Oakland (CA) Academies Magnet Programs, cited in deLeeuw, David, et al. (1992) Examples of Integrated Academic and Vocational Curriculum from High School Academies in the Oakland Unified School District; National Center for Research in Vocational Education, Berkeley, CA.; and a virtual paraphrase of Missouri's Outstanding School Act, SB380)

- All emphasize active or applied learning, which has been defined as including techniques that provide students the opportunity to apply knowledge and skills through authentic tasks that resemble things that students need to know or want to do. It has also been further

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DEFINED AS REQUIRING "THE INSTRUCTOR TO FACILITATE LEARNING RATHER THAN DO ALL THE TEACHING AND TO PROVIDE APPROPRIATE, STRUCTURED ACTIVITIES THAT GET THE LEARNER TOTALLY INVOLVED IN APPLYING, USING, AND THUS 'OWNING' WHAT WAS PRESENTED. . . . THIS INVOLVES WORKING WITH OTHERS AS A TEAM OR WORK GROUP, SOLVING REAL PROBLEMS, CREATING PRODUCTS, COMPLETING PROJECTS, AND SEEKING ANSWERS TO QUESTIONS FOR WHICH AN ANSWER DOES NOT YET EXIST." (BLANK, WILLIAM E., AND JANET B. SCAGLIONE. INTEGRATING ACADEMIC AND VOCATIONAL EDUCATION: IMPLEMENTATION GUIDE. TALLAHASSEE: FLORIDA STATE DEPARTMENT OF EDUCATION, 1992, P. 29)

• ALL EMPHASIZE ORGANIZING CURRICULUM AROUND BIG IDEAS, PRIMARY CONCEPTS, ETC., RATHER THAN DISCRETE SKILLS AND FACTS; OR SAID ANOTHER WAY, ALL EMPHASIZE LEARNING FROM WHOLE TO PART RATHER THAN PART TO WHOLE (SEE THE ANDERSON AND ARMBRUSTER MAXIMS DISCUSSED IN AN EARLIER SECTION). JAMES BANKS (PROFESSOR OF EDUCATION AT THE UNIVERSITY OF WASHINGTON AND PAST-PRESIDENT OF THE NATIONAL COUNCIL FOR THE SOCIAL STUDIES) PROPOSES THAT "THE ISSUES SELECTED FOR STUDY BE ONES THAT HAVE BEEN OF CONCERN TO HUMANS IN THE PAST, THAT ARE OF CONCERN TODAY, AND THAT WILL BE IMPORTANT CONCERNS IN THE FUTURE." (BANKS, JAMES A. "SOCIAL SCIENCE KNOWLEDGE AND CITIZENSHIP EDUCATION," IN *TEACHING ACADEMIC SUBJECTS TO DIVERSE LEARNERS*, MARY M. KENNEDY, ED. NEW YORK: TEACHERS COLLEGE PRESS, 1991, PP. 124-25.)

• ALL EMPHASIZE CONNECTED OR INTEGRATIVE CURRICULUM, DEFINED AS CURRICULUM IN WHICH THE FOCUS IS NOT UPON HOW THE CURRICULUM IS ORGANIZED, BUT "UPON THE TEACHING AND LEARNING, UPON DEVELOPING A FLEXIBLE INDIVIDUAL WHO IS SELF-RELIANT AND WHO IS SEEKING RELATIONSHIPS BETWEEN PAST AND PRESENT EXPERIENCES AND LEARNINGS." (TYE, KENNETH A., THE JUNIOR HIGH: SCHOOL IN SEARCH OF A MISSION. LANHAM, MD: UNIVERSITY PRESS OF AMERICA, 1985.) ANOTHER WAY OF SAYING THIS IS THAT A CONNECTED CURRICULUM IS ONE THAT IS DESIGNED SO THAT RELATED CONCEPTS, GENERALIZATIONS, CONTENTS AND/OR PROCESSES ARE BROUGHT TOGETHER FOR LEARNERS; IT IS SOMETIMES REFERRED TO AS HOLISTIC OR COMPREHENSIVE. WITHIN THIS CONNECTED CURRICULUM, ALL EMPHASIZE THE IMPORTANCE OF STUDENTS LEARNING HOW TO LEARN.

• ALL EMPHASIZE CONTEXTUALIZING THE LEARNING EXPERIENCES OF STUDENTS. THAT IS, EVERYONE (WHETHER ELEMENTARY STUDENT OR ADULT) WANTS TO KNOW "WHY SOMETHING IS IMPORTANT TO LEARN" OR "WHEN THEY WILL NEED THE INFORMATION OR SKILL." EMBEDDING LEARNING WITHIN REAL-

WORLD CONTEXTS HELPS STUDENTS DISCOVER ANSWERS TO THESE IMPORTANT QUESTIONS.

The following Structures or organizers are presented:

- THE **NATIONAL CENTER FOR RESEARCH IN VOCATIONAL EDUCATION (NCRV OR GRUBB)** MODELS FOR INTEGRATING ACADEMIC AND VOCATIONAL EDUCATION THEMATIC UNITS, CURRICULUM BLOCKS, AND CONCEPTUAL CLUSTERS,
- APPLIED ACADEMICS,
- CAREER PATHS, AND
- THEMATIC UNITS AND CURRICULUM BLOCKS

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NCRVE MODELS

These eight models emerge from a vocational orientation; that is, their originators (Grubb, et al.) start from the assertion that vocational education must have a broader purpose and focus in the future. They observe that vocational education can serve as a delivery system in which various subject areas blend and interrelate into an integrated and comprehensive education program that emphasizes higher order thinking and problem-solving skills. "By utilizing a variety of approaches, such as cooperative learning, applied instructional strategies, problem solving and experimentation, this new integrated instructional system will help students learn how to learn." (Grubb, 1991) Since these eight models emerge from a vocational education orientation, they are also not surprisingly focused on secondary school since the majority of vocational education has traditionally occurred at the upper grade levels; however, the ideas embodied in these models are being implemented at all levels of education—from elementary to post-secondary. Following the descriptions of the NCRVE models is a tabular presentation of the impacts and implications of each model.

Model 1: Incorporating Academic Competencies into Vocational Education Courses

In this model, vocational educators incorporate more academic material into existing vocational education courses. From a greater emphasis on the mathematics necessary to understanding electronics to the communication skills necessary to functioning within a business setting, vocational educators are redressing the long-standing separation of "heads and hands" addressed by Dale Parnell and others.

Model 2: Combining Academic and Vocational Teachers to Incorporate Academic Competencies into Vocational Education Courses

A somewhat different approach has assigned academic teachers the responsibility of increasing the academic components of vocational education programs. Academic teachers can then teach individual lessons or units for vocational students, help vocational teachers to develop their own academic exercises, or pull students out of vocational education classes to work on academic competencies.

The crucial element in this approach (in contrast to the first model) is that the academic and vocational teachers collaborate in modifying vocational education programs. While clearly an advantage in that it recognizes the importance of communication within a faculty, this model neither bears directly on the academic side nor does it necessarily become institutionalized throughout the school or school system.

Model 3: Making the Academic Curriculum More Vocationally Relevant

This third model modifies the academic curriculum instead of the vocational education courses, by incorporating vocational applications and examples and reconfiguring academic courses so that the topics are more relevant to vocational students and probably all students. A common approach has been to introduce specific courses, e.g., the "applied academics" courses including "Principles of Technology," "Applied Mathematics," "Applied Communication," as well as several others less commonly adopted. *See the section on Applied Academics for more information on these courses.* This model has the obvious advantage of contextualizing the learning of all students (at least potentially) within pre-packaged courses of study. It has a long-term disadvantage of remaining within specific courses and not significantly modifying (or contextualizing) the entire curriculum.

Model 4: Modifying Both Academic and Vocational Education and Curricula Alignment

This model combines elements from the preceding approach, by using more occupationally-relevant material in academic courses and more academic material in vocational education courses, and then linking the two. This may happen when two or more teachers, from both the academic and the vocational sides, coordinate the content of what they teach at a particular time (see earlier discussion of "parallel planning"). This kind of alignment is sometimes referred to as "horizontal alignment" (as opposed to the more common notion of "vertical alignment"). In the best cases, this practice creates sequences of academic and vocational education courses that reinforce each other, thereby clarifying that integrating academic and vocational education is an activity that can consider entire programs rather than just individual courses.

Model 5: The Academy Model

Academies are schools-within-schools that typically include academic teachers in English, mathematics, and science with a vocational instructor in a subject, like health, electronics, robotics, business, or agriculture. Because these teachers stay with a group of students for all courses and potentially over several years, the possibilities for both horizontal and vertical alignment of the curriculum are increased considerably. Academies also frequently establish close relationships and partnerships with particular businesses operating in their area, thereby providing students with additional motivation, mentors, and internships. Although the idea of the academy may have originated at the high school level, they are now emerging at the middle school level as well. The advantages of the kind of powerful working relationships that emerge between and among faculty and students are self-evident.

Model 6: Replacing Conventional Departments with Occupational Clusters

A few high schools around the country have taken the idea of the academy one step further toward full interdisciplinary education (i.e., adapting the scope and sequence of the content to address themes, here occupational clusters are related to or overlap different subject areas. Connections are perceived through an inquiry inspired by the theme. Intended outcomes are broader than those owned by a single discipline) and even transdisciplinary education (i.e., seeing content and the theme as one and the same, erasing previously created content divisions. Connections are embedded in a real-life theme having meaning and relevance to the learner.) These schools organize themselves around occupational clusters in place of conventional academic and vocational departments. Like the focus of the academy on a particular occupational area, this model facilitates cooperation among teachers and both horizontal and vertical alignment, and provides academic teacher with obvious vocational emphases to incorporate into their classes.

Model 7: Single-Occupation High Schools

In some cities, single-occupation high schools have developed; some of the more famous examples include the New York City for the Performing Arts and its counterpart in Los Angeles, both of which have been highlighted in the media. Like an academy or a single-occupational-cluster department, these schools provide an obvious focus for efforts to integrate academic and vocational education and a

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culture in which the occupational content of coursework cannot be ignored.

See the case study on Kansas City East High School elsewhere in this manual for an extended discussion of a high school organized around environmental studies and agribusiness.

Model 8: Electing Career Paths or Occupational Majors

A final approach is to maintain conventional academic and vocational departments, but in addition to have students and teachers organized in "career paths" or occupational clusters. This creates a matrix structure in which teachers participate in both departmental discussions about the content of particular academic and vocational education courses and in a career path grouping within which they can develop coherent sequences of courses and coordinate particular courses in the career path. In addition, career paths force students to think harder about their occupational futures, supported by counselors. This organization (or at least focus) also combines students from different backgrounds with very different occupational ambitions, thereby reducing the usual segregation of college-bound and vocational students—a clear advantage to promoting democratic education and communicating to students and parents that the school has high expectations for all students.

On one scale or another, high schools across the state are exploring how to infuse career path awareness into their existing curriculum and structure, especially those involved in the A+ Schools Program.

For more information, see Grubb, N. et al. (1991) The Cunning Hand; The Cultured Mind: Models for Integrating Vocational and Academic Education. Berkeley, CA: National Center for Research in Vocational Education (NCRVE), University of California, Berkeley.

An additional source of information on the eight NCRV models can be found in Reid, Mark E. & Tsuzuki, Mayo. National Roster of Local Practices in the Integration of Vocational and Academic Education. NCRVE, February 1994; this 103-page document details the pros and cons of each model and provides actual schools engaged in implementing each of the models. The document is available from the NCRVE Distribution Service, 46 Horrabin Hall, Western Illinois University, Macomb, IL 61455 (order no. MDS-768; price, $6.00)

With the general descriptions in mind, the following table displays the kinds of demands on teachers, students, and very structure of the school against each of the eight models.

Note: As the following table and models are reviewed that the table collapses "Model 6: Replacing Conventional Departments with Occupational Clusters" into Models 7 and 8; the table then identifies another approach, "5. Senior Projects," as yet another way to integrate academic and vocational study—here taking on the appearance of a graduation exhibition or demonstration. For a fascinating case study of one such program, see Meier, Deborah and Schwarz, Paul. "Central Park East Secondary School: The Hard Part is Making It Happen," in Democratic Schools, ed. Michael W. Apple and James A. Beane, ASCD, 1995, pp 26-41; in this inner-city high school, students present themselves and their portfolio to a committee of faculty who determine with the student whether he/she is ready to graduate from high school. Another example is to be found in the reforms of secondary education being implemented in New Zealand schools. There students spend the entirety of their senior year engaged in a substantial research project, the results of which they present to faculty for certification of their mastery of the secondary curriculum.

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Model and Curriculum	Teacher Changes	Students Targeted	Structural Changes
1. Vocational teachers introduce academic competencies into vocational courses.	Vocational teachers modify curriculum, teaching methods.	Vocational students.	None.
2. Combining vocational and academic teachers to enhance academic content in vocational programs.	Academic teachers cooperate with vocational teachers to modify curriculum, teaching methods.	Vocational students.	None necessary; lack of shared planning and teaching periods or physical distance between vocational and academic classrooms may impede cooperation.
3. Making academic courses more vocationally relevant.	Academic teachers (usually) modify courses or adopt new ones.	Potentially all students: in practice, vocational and general-track students.	None.
4. curricular alignment, horizontal and vertical. Both vocational and academic courses are modified and coordinated across courses and/or over time.	Vocational and academic teachers cooperate, coordinate curriculum modules, and modify teaching methods: numbers range from two to all.	Potentially all students, actual targets vary.	None necessary; shared planning periods and curriculum teams may foster cooperation.
5. Senior Projects Seniors replace electives with a project: earlier courses may change in preparation.	None necessary: project advisors and evaluators are normally recruited and evaluation standards must be determined: teachers may develop new courses or modify content to better prepare students.	Potentially all students; actual numbers depend on advising and evaluating capabilities.	None necessary.

Model and Curriculum	Teacher Changes	Students Targeted	Structural Changes
6. Academy model. Alignment among academic courses (core academics and vocational focus) may take place.	Vocational and academic teachers may collaborate on both curriculum and students.	Usually potential dropouts; sometimes students interested in specific occupational areas.	School-within-a-school; block rostering; smaller classes; links to employers.
7. Occupational high schools and magnet schools. Alignment among all courses may take place, emphasizing the occupational focus.	All vocational and academic teachers assigned to an occupational school or magnet within a school; collaboration and course alignment facilitated.	Students interested in specific occupational areas.	Creation of a self-contained occupational school or magnet school.
8. Occupational clusters, career paths, and majors. Coherent sequences of courses created; alignment may take place among courses within clusters.	Teachers belong to occupational clusters rather than (or in addition to) conventional departments; collaboration and course alignment facilitated.	All students.	Creation of occupational clusters; enhancement of career counseling; possible cluster activities.

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Applied Academics

Developing and implementing applied academics courses is perhaps one of the most common ways to integrate curriculum. These courses teach traditional material in a contextual manner, attempting to help more students successfully learn the material by bringing the "real world" into the classroom. Hull and Parnell's definition of and justification for applied academics reads: "Today, the advent of rapidly changing technologies, both at home and abroad, clearly signals the need for an educational system that combines the best in vocational and academic learning - that is, teaching academic foundation courses in a vocational setting. Such a strategy is generally referred to as applied academics" (Hull and Parnell, 1991).

In "Helping Teachers to Understand Their Roles in Integrating Vocational and Academic Education," a field study in which over 100 teachers, counselors, principals, and administrators at ten schools were interviewed about integration, Schmidt et al. write that academic teachers "were particularly excited about approaching instruction through application or the use of hands-on learning." They explain that these teachers think their teaching is more effective when done in an applied manner. They cite examples of a science teacher who now shows students how they will use the concepts he/she teaches in experiments before introducing the concepts and of an auto mechanics teacher who teaches safety rules by having students write a business letter as a representative of an insurance company who has found safety violations in an auto repair business. Schmidt and colleagues conclude: "For the applied approach to be successful, teachers must be willing to change from past instructional procedures. They must also learn to assess the outcomes of the new instruction carefully and to use applied approaches only when effective" (Schmidt et al., p. 13).

Some teachers have expressed concern that students taking applied courses will have trouble with college transcript analyses. In response to that concern, the Missouri Department of Elementary and Secondary Education has for some time been working with the state's Coordinating Board for Higher Education and the University of Missouri in certifying applied courses. Their joint efforts have, for example, resulted in the University of Missouri accepting "Principles of Technology" as equivalent to a physics course. College admissions officers in this and other states are quick to assert their eagerness to work with schools and their students in the admissions process.

For more information about a college's willingness to accept applied courses, contact the admissions office for your local college or university. Another source of information would be the Department of Elementary and Secondary Education, Division of Vocational and Adult Education.

Several courses in applied academics have been developed in recent years. For example, the Agency for Applied Technology (AIT) has developed courses in Applied Communication and Workplace Readiness, and the Center for Occupational Research and Development (CORD) has developed courses in Applied Mathematics and Applied Biology/Chemistry. Together, AIT and CORD developed Principles of Technology. All of these courses, and others like them, are designed to help students apply what they are learning in a real-world setting, allowing them to put their new-found knowledge into practice immediately.

For more information about these and other materials, contact: Agency for Instructional Technology, Box A, Bloomington, IN 47402; 1-800-457-4509; and Center for Occupational Research and Development, 601 Lake Air Drive, Waco, TX 76702-1689; 1-800-2311-3015. Missouri is a member of the consortium that developed these AIT and CORD materials, so substantial product discounts are available to Missouri educators.

References

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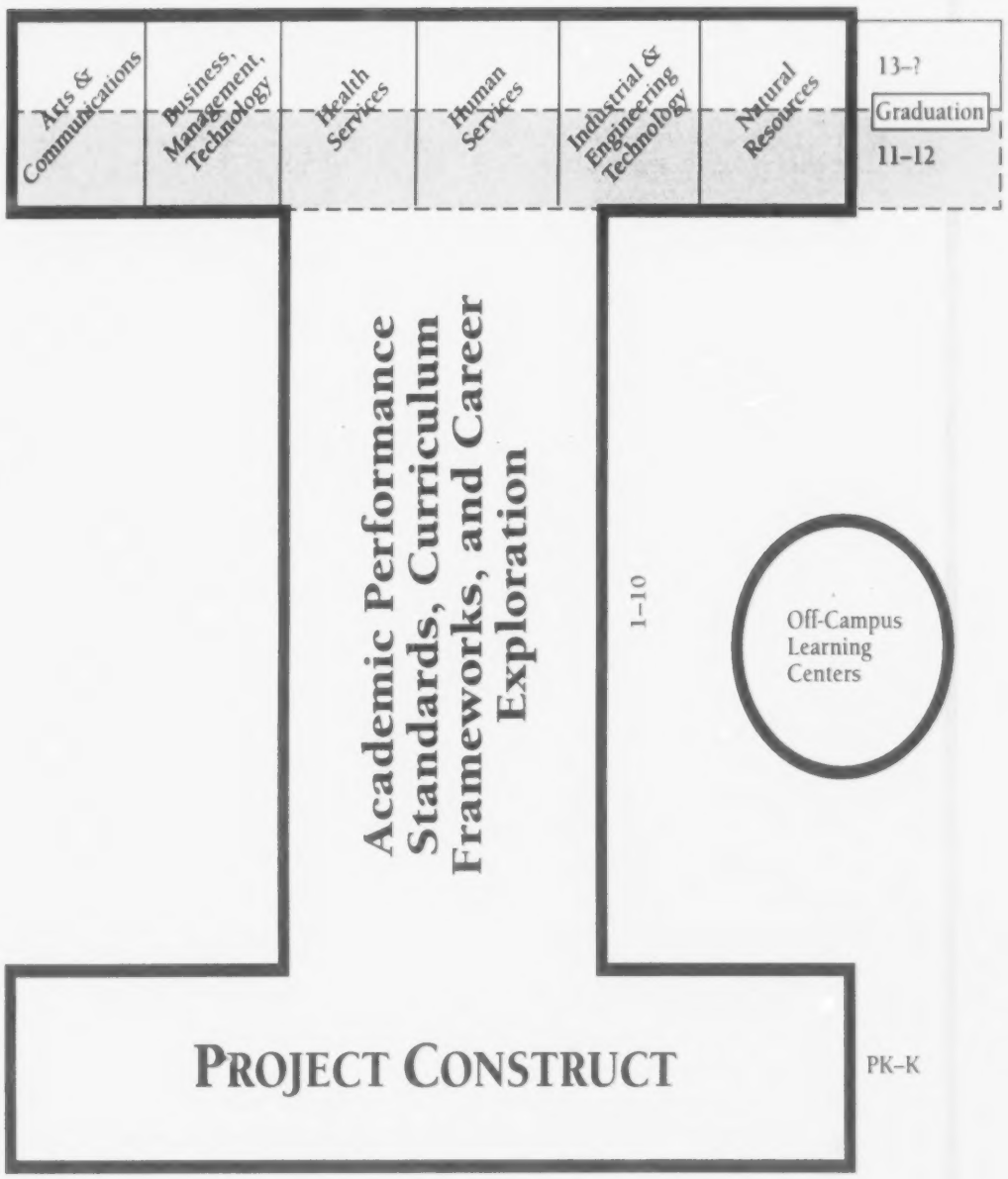
CAREER PATHS

Career paths are clusters of occupations/careers that are grouped because many of the people in them share similar interests and strengths. Many schools across the country are using the model developed by the state of Oregon, which has six career paths: arts and communications; business, management and technology; health services; human services; industrial and engineering technology; and natural resources. All six of these paths include a variety of occupations that require different levels of education and training, and all of the paths have equal dignity. Thus, all students can use career paths to prepare for their futures, regardless of their interests, abilities, talents, or desired levels of education.

By deciding on a career path, a student gains an area of focus into which he or she can begin directing energy. The career path can help guide: course selection; participation in workplace readiness programs like cooperative education and Tech Prep Education; selection of extracurricular activities; and part-time employment. However, because the student selects a career path with many occupations in it instead of selecting a particular career or occupation to focus on, the student still has the flexibility to explore different occupations and to participate in a wide variety of learning opportunities.

In order for the student to select a career path, she or he must first identify interests, abilities, and talents; and then consider possible careers in each path in relationship to these traits. The student is then ready to make a career-path decision, and to select courses and other activities that match that path.

As a result of the national focus on school-to-work transition and Missouri's A+ Schools program, many Missouri school districts are considering career paths as an overall organizer for their curriculum—particularly from grade 8 and above. The following diagram offers one way to see how career awareness and exploration can become a major focus of schools.



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Starting from the bottom of the "I," students embark on their educational careers upon a solid, constructivist foundation *(see earlier discussion of constructivist principles)*. Grades one through ten focus on the knowledge, skills and competencies described in the Missouri Academic Performance Standards and Curriculum Frameworks. Suffused throughout the regular curriculum are opportunities for students of all ages to explore the variety of occupations available to them; such an infusion of career awareness and exploration would naturally involve the school guidance staff at every level. Grades nine and ten might be seen as focused experiences through career-exploration seminars *(described below)*. Throughout their curriculum, students might also have available off-campus learning centers for specialized information and services. Upon completion of what might be called the general preparation curriculum, eleventh-grade students would begin to specialize in one career path, recognizing that their eleventh- and twelfth-grade experiences would be sufficiently common across all career path seminars to allow for lateral movement.

An important thing to remember about career paths is that they are not based on specific jobs; rather they are categories of occupations that cluster around a central theme within which are many occupations, each requiring different amounts and kinds of secondary and post-secondary education. The implication of career paths for students is that rather than schools making decisions for students, students (and their families) will make decisions for themselves. From earlier grades, students would have learned about their options within each path; therefore, a student could exit a path and reenter at a later time for additional education. For example, a student might embark on the health services path while still in high school intending to pursue a career in nursing. After High School graduation and upon completion of a post-secondary nursing program and working the field for a while, the student might later decide to reenter the path and pursue a medical degree, which could result in the highest levels of medical research. On the other hand, this same student might begin in the health services path and later decide to alter his or her course a bit to focus on a career in a social service agency. Although the student would need to back up a bit to enter the new path, the solid grounding in eleventh- and twelfth-grade would ease the transition considerably. The point is that building a curriculum with a career-path focus provides students the tools to make informed decisions well beyond their time in the public schools.

For more information on using career paths as a major organizer

of school curriculum, contact the Oregon Department of Education for information on their Certificates of Initial and Advanced Mastery.

On a smaller scale, career paths can also be a useful organizer for teachers seeking a context around which to build integrated courses and individual units within existing courses. In that career paths are based in the real-world, they automatically provide countless opportunities for contexturalizing students' experiences with the curriculum at all grades.

At the course level, ninth- and tenth-grade teachers might consider freshman/ sophomore career exploration seminars. Given the six paths, teachers might divide the year into six major units of instruction, each built around a project appropriate to a particular path. Early in the year, planners might focus on the Arts and Communication path, engaging students in creating multimedia entertainment programming that might result in presentations at the ninth- or tenth-grade fall dance. Later in the year when students have developed more mathematics skills, planners might focus on the Industrial and Engineering Technology path, engaging students in designing and modeling an energy-efficient home design for presentation to area architects and contractors.

At the unit level, teachers within and across the disciplines can identify topics embedded within a path. For example, a high-school chemistry unit might focus on the Health Services path by studying forensic science; students might be engaged in collecting and analyzing evidence to solve a criminal case. A fourth-grade social studies/ science/communications unit might focus on the Natural Resources path, engaging students in an environmental study that is part of the regular curriculum; that is, fourth-graders across the state typically study Missouri at some point during the year. In either example, adding information about the path serves to heighten the sense of reality for the students. Rather than merely studying ecosystems for sake of studying them, students might now be engaged in planning an educational program for younger children about the ecosystems present in a local park, an activity well within both the purview of someone working within the Natural Resources path and the regular curriculum. In the high school example, rather than studying blood chemistry for the sake of passing the test, students engaged in solving a crime now have a specific context within which to conduct their investigation and a goal (product) toward which to focus their attention.

Schools who have adopted the career-paths philosophy may find that an integrated approach to learning makes good sense. In discussing integration within career academies, Stern writes:

"Generally, integrating the vocational and academic curriculum is seen as a means to improve the teaching of academic subjects by relating them to a practical context, improve instruction in vocational subjects by upgrading the academic content, and minimize invidious tracking of students . . . The boundaries between disciplines should be less important than the issues being analyzed, skills being mastered, concepts being understood (deLeeuw et al., p. i-ii).

For example, instead of requiring those students who have chosen the health services career path to take discreet courses in mathematics, science, English, social studies, and health services, why not create a school-within-a-school for those students that allows them to learn the skills and acquire the knowledge in all of these areas that they will need in order to be successful in the health care professions? At the Oakland Health Academy, a school-within-a-school at Oakland Technical High School in Oakland, California, students are scheduled as a group for science, science labs, English, and social studies, and they take the Health Academy mathematics sections appropriate to their level of study whenever possible. Students gain many of the traditionally vocational health skills in their biology and physiology labs (deLeeuw et al., p. 7).

Organizing students into career paths and scheduling them as described above can make integrating curriculum easier. Teachers in such a system have the advantage of being able to coordinate instruction and projects more easily, as they share a common group of students. They may also have more flexibility in how they use the block time; one day may be devoted to a lengthy science lab, while the next day contains extended time for students to complete an in-class writing assignment. Perhaps most importantly, when the focus is not on learning a particular set of skills or gaining a set amount of knowledge for an individual course, students can see more clearly how skills and knowledge in a variety of areas work together and apply to the career path they have chosen. "Ultimately, students in a highly integrated program would not even need to know which course they were in at any particular moment," writes Stern (deLeeuw et al., p. ii).

Teachers in schools that have not adopted career paths may not have the flexible scheduling options and organization of students described above, but they can still use career paths as a way of integrating their curriculum with the real world. For example, a mathematics teacher might choose to introduce a unit on fractions by discussing how careers like nursing and building trades involve the use of fractions. Guest speakers from different professions can be asked to explain how they use mathematics skills on a daily basis, and word problems presenting real-life situations that require on-the-job mathematics solutions can be presented.

References

deLeeuw, D. et al. (1992). Examples of integrated academic and vocational curriculum from high school academies in the Oakland Unified School District. Berkeley: National Center for Research in Vocational Education, University of California at Berkeley.

Thematic Units, Mental Processes, and Curriculum Blocks

This section will describe three additional vehicles for planning and delivering content. Whereas Applied Academics, the NCRVE (or Grubb) Models for Integrating Academic and Vocational Education, and Career Paths tend to suggest vocationally focused integration, themes, mental processes, and curriculum blocks suggest academically focused integration. One orientation is not to be seen as preferable to the other; rather, each offers teachers a way into integration that may be more comfortable or more consistent with a particular school's mission than the other. Even within this set of three, one is not to be seen as preferable to the others. Indeed, there is considerable overlap among the three.

Thematic Units

Thematic Units are probably the organizing device best known to teachers, particularly those in traditional elementary/middle education and secondary academic disciplines. "Theme" is here used as merely a generic term for any title, topic, concept, issue, or problem that is used as the unifying focus for study. Themes can be drawn from any perspective across the curriculum. Some, like the Banks themes listed in the "how to integrate" section of this manual, have a predominantly social studies flavor; others, like the Gateway Middle School themes also listed in the "how to" section, have a more mathematics, science, technology flavor. Regardless of the source within the curriculum, a really useful theme will be broad enough to contain several contexts, concepts, or topics. As James Banks puts it, "themes should have enduring value; topics, on the other hand, are frequently grounded in a particular moment in time or in a particular context." Justice, for example, is a theme, within which students might explore several specific legal issues or several specific kinds of justice. Systems is similarly a theme large enough to contain mechanical systems in engineering (i.e., force, motion, and mechanical energy in science), transportation systems in discrete mathematics, and linguistic systems in language arts curriculum. If a goal of integration is to help students see how the parts fit within the big picture, then themes selected for study must be sufficiently large to

contain those different perspectives. Seen in this way, themes are the "big ideas, overarching concepts, unifying constructs, underlying metaphors, the sap that runs through the curriculum." (Rutherford and Ahlgren)

Mental Processes

A variation on the "big ideas" approach suggested by "themes" as an organizer is one in which the focus of learning is on mental processes, e.g., classification/ division or comparison/ contrast. As with the themes, these processes cut across disciplines. For example, most disciplines use classification and division as a building block for thinking about themselves: chemistry has its periodic table, botany has its phylum; mathematics requires sorting and grouping; literature has genres. All of these ways of structuring knowledge require the mental act of classifying and dividing; each discipline may, however, have slightly different ways of using the process. Through a focus on similarity and difference across the disciplines, students gain a deeper understanding of the process and a deeper understanding of the ways in which knowledge is constructed and used in a variety of contexts.

Two resources will be particularly useful in identifying specific concepts (or mental processes) with which students need experience across the curriculum: the "process" standards articulated in the Missouri Academic Performance Standards (see the Show-Me Standards, October 1995) and the work of Robert Marzano. Debra Pickering, and Jay McTighe.

Without going into the full model of learning portrayed in *Dimensions*, or listing all of the "process" standards articulated in the Academic Performance Standards, or asserting that the ideas are unique to either source, let's consider the variety of reasoning processes that might be used to organize curriculum:

- COMPARING: IDENTIFYING AND ARTICULATING SIMILARITIES AND DIFFERENCES
- CLASSIFYING: GROUPING THINGS INTO DEFINABLE CATEGORIES ON THE BASIS OF THEIR ATTRIBUTES
- INDUCING: INFERRING UNKNOWN GENERALIZATIONS OR PRINCIPLES FROM OBSERVATION OR ANALYSIS
- DEDUCING: INFERRING UNSTATED CONSEQUENCES AND CONDITIONS FROM GIVEN PRINCIPLES AND GENERALIZATIONS
- ANALYZING ERRORS: IDENTIFYING AND ARTICULATING ERRORS IN ONE'S OWN OR OTHERS' THINKING
- CONSTRUCTING SUPPORT: CONSTRUCTING A SYSTEM OF SUPPORT OR PROOF FOR AN ASSERTION
- ANALYZING PERSPECTIVES: IDENTIFYING AND ARTICULATING PERSONAL PERSPECTIVES AND ISSUES

In one way or another, all areas of study---those traditionally seen as academic and those traditionally seen as vocational-technical—require facility with these mental activities. Since these processes are so universal, they are not only vital to student success across the curriculum, but they are also points where the curriculum naturally intersects; therefore, they become valuable tools for teachers desiring to address fragmentation across their curricula.

Curriculum Blocks

Thematic units and mental processes might be most usefully seen as representing two axis of a grid. That is, if "justice" has been identified as the theme, then the mental process can be identified through which students are to explore the theme. For example, within the broad theme of justice, the teacher might want students to explore the American legal system. To help them develop a deeper understanding of the American legal system, the teacher has them study our system through comparing it to the French system or the English system. In this very specific example, the instructional goal is twofold: one involves a desire for students to develop a deep understanding of the way the legal system works in America; the other involves a desire for students to develop a deep understanding of how knowledge can be organized to give it meaning. As important as integrating content and process is for students' learning, it is not sufficient to meeting the needs of students. When, however, one adds purpose or meaningfulness to those intersection points, the subject matter (both content and mental process) comes alive.

One way to give content choices purpose (meaning, context) is to be found in curriculum blocks (see Ahlgren, Andrew, and Sofia Kesidou). Those working on the Project 2061 national science project identified four distinct purposes within which students conduct their study; although the 2061 work originates in science, the following purposes can serve across the curriculum:

* "Finding out about how something in particular in the world works (description and explanation)"
* "Solving a practical problem (design)"
* "Reflecting on some enduring human concern (issues)"
* "Learning about how we know what we know (inquiry)"

As described by the authors, these purposes "provide a vision of the ways literate people use knowledge and skills." In short, posing students with one of these purposes as the context for their study of content and mental processes will help them answer the age-old question, "What am I supposed to do with this information?" Obviously, these are not the only four ways to contextualize students' study. Another model for establishing context for study focuses on issues analysis, decision-making, and problem-solving as ways to contextualize study; see the "how to" section of this manual for discussion of two logical process models that teachers have found useful. *More broadly, for further discussion of establishing purposefulness in integrated units, see the "how to" section of this manual.*

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